What is the risk to safety and confidentiality in light of advancing mobile technology for patients undergoing hospital treatment in New Zealand?

A descriptive exploratory study

Emily Keefe

A dissertation submitted in partial fulfilment of the requirements for the Master's degree in Health Sciences

University of Canterbury
Te Whare Wānanga o Waitaha
Christchurch, New Zealand
January 2016

The material presented in this Master's dissertation is the original work of the candidate except as acknowledged in the text, and has not been previously submitted, either in part or in whole, for a degree at this or any other university.

Emily Keefe

Competing Interest: Emily Keefe is employed as a Medical Photographer.

This dissertation is dedicated to my parents, Dr Martin Keefe and Carolyn Jane Keefe.

For always standing by me and encouraging me to be the best that I can be.

Acknowledgements

Firstly and foremost, I must acknowledge the invaluable help that I have received from the people that have assisted me with this project. I cannot thank my supervisors enough, particularly Dr Isabel Jamieson and Dr Alison Dixon. For their excellent guidance, expertise and wisdom I will be eternally grateful. It has been a massive learning curve for me, one which has provided a wealth of experience and memories that I shall treasure. Thank you for nudging me along and helping me to achieve more than I ever imagined I could.

I would also like to thank the Executive Directors for Nursing and Allied Health and the Chief Medical Officer. Without your support in the early stages of the project's initiation, this would not have been possible.

My sincerest thanks also go to the Clinical Manager of the Medical Illustration department and the Manager of Clinical Technologies. Their support and assistance has been invaluable in helping me source the information that I needed in writing this report.

To all of the nursing, medical and allied health respondents who took the time to participate in the survey. Thank you also for putting up with my weekly emails of persuasion. Your contribution has been invaluable to this research and I really appreciate your honesty in the process.

On a final note, to the person and pets who have shown me so much love and support throughout this journey. My husband Toby, who I had the pleasure of tying the knot with during the midst of this project. I could not have done this without you. And to my dogs, Indy and Jack, for forcing me to leave my computer at least once a day for walks and for taking it in turns to keep my feet cosy under the desk. My thanks and love to you all.

Abstract

Background

This descriptive explorative study had two aims. Firstly, to survey the use of mobile phones by health professionals for photographing patients, their body parts/organs or confidential patient information in the clinical setting of a DHB. The second aim was to explore the perceptions and attitudes of health professionals in regard to the DHB's policy on photographic recordings. It was hoped that results would show whether there was a need for update of local policy, which would in turn provide clarification of the responsibilities that health professionals have in maintaining the confidentiality of patient images on personal mobile devices. Overseas evidence suggests that ownership and use of mobile phones for their photographic capabilities in the healthcare setting is high. However, until now, no research has been conducted in New Zealand. The clinical mobile phone photography practices of health professionals in New Zealand has major implications for maintaining the confidentiality of the patient record and the integrity of the medical photography profession.

Method

An online survey comprising 36 questions was distributed via email to all nursing, medical and allied health staff members employed at the local DHB. The survey was open for responses for a three week period from late September to mid October 2015.

Key findings

951 completed responses were received. A third of respondents (33.1%, n=306) had taken photographs of patient or patient information using a mobile phone yet written consent was obtained by only 28.4% (n=87) of respondents. When consent was obtained, verbal was the most popular method (85.9%, n=263) with 40.8% (n=125) of respondents rarely or never recording in the patient's notes that they took photographs.

The most common location for storing images taken personally was on the mobile phone itself (45.7%, *n*=106). Respondents were more likely to take non-identifiable images than identifiable images on their mobile phones. Them most common reason for taking photographs of patient or patient information was for input from another health professional (26.5%, *n*=252), 17.3% (*n*=164) for education/training purposes and 9.5% (*n*=90) for presentations.

Three-quarters of respondents were either unaware of local policy regarding photographic recordings or were aware of it but had not read it. The majority of respondents thought that the patient owned images taken on health professionals' mobile phones (65.2%, *n*=691).

Conclusion

Despite being the first study of its kind in New Zealand, evidence suggests that a proportion of health professionals are utilising mobile phone technology to perform photography in the clinical setting. Most health professionals are aware of their responsibilities surrounding maintenance of patient privacy. However, as mobile phone photography is becoming increasingly common in patient care, evidence here suggests that not all health professionals understand the value they hold and are unaware of their responsibilities for managing the safe storage and movement of these images. Update of local policy in line with professional medical photography guidelines is required to match advancement in technological capabilities available to health professionals. This would improve the integrity and safe handling of images that form part of the confidential patient record.

Table of contents

List of tables

List of figures

Contact details of researchers

This study was carried out by Emily Keefe, the author:

Emily Keefe

Masters Candidate in Health Sciences

Health Sciences Centre

University of Canterbury Te Whare Wānanga o Waitaha

Private Bag 4800

Christchurch 8140

New Zealand

Email: emily.keefe@yahoo.co.nz

Dr. Isabel Jamieson and Dr. Alison Dixon were the supervisors of this study:

Dr Isabel Jamieson

Principle Academic Staff Member (CPIT) and Adjunct Senior Fellow (University of Canterbury)

Department of Nursing and Human Services

Christchurch Polytechnic Institution of Technology Te Mātāpuna o Te Mātauraka

PO Box 540

Christchurch 8140

New Zealand

Phone: +64 (0)3 940 8250

Email: isabel.jamieson@cpit.ac.nz

Dr. Alison Dixon

Senior Lecturer and Programme Coordinator

Department of Nursing and Human Services

Christchurch Polytechnic Institution of Technology Te Mātāpuna o Te Mātauraka

PO Box 540

Christchurch 8140

New Zealand

Phone: +64 (0)800 242 476

Email: alison.dixon@cpit.ac.nz

1 Introduction

In this study, the author has assessed the risk to patient safety and confidentiality in light of advancing mobile technology for patients undergoing treatment at a New Zealand hospital. The study came about due to the author's background and interest in medical photography combined with further postgraduate education in nursing and health science.

The study provides a snapshot in time firstly of current mobile phone photography practice in the clinical setting of a New Zealand District Health Board. Secondly, it explores the attitudes and awareness of health professionals to local policy for photographic recording.

Chapter one provides a statement of the issue and background information to the study. Chapter two compares the literature that already exists on the topic and it's relevance to the New Zealand context.

Chapter three contains the methodology of this study. This includes information about the original basis for the research design, the sample group, ethical considerations, reasoning for the choice of survey tool, the survey tool used, data collection, validity and data analysis.

The results section in chapter four details the findings of this study, which are then addressed in the discussion in chapter five. This final chapter also addresses the study's strengths and limitations and recommendations for future research.

1.1 Statement of the issue

The idea for this project originated from the researcher's personal experience as a Medical Photographer. During time in this role, the researcher and others employed in the same role noted increasing use of personal mobile devices (mostly mobile phones) by nursing, medical and allied health staff to take photographs of patients and confidential patient information. There were a number of occasions where it was unclear if informed consent had been obtained or whether the images were being disseminated according to the policies of their local District Health Board (DHB) (Appendix A).

The use of personal mobile devices to collect sensitive and confidential information is a concern for members of the medical photography profession. This is particularly in light of recent media reports concerning unlawful access of electronic patient records by a small number of health professionals around New Zealand (NZ) and overseas (Radio New Zealand, 2013; Torrie and King, 2013; Scott, 2015). On reflection of these experiences, the researcher felt that it would be useful to investigate how common it was for health professionals to use their mobile phones to photograph patients or confidential patient information. This was to provide a 'snapshot' in time of mobile phone photography practices amongst health professionals. Additional investigation regarding the general level of awareness and understanding of local DHB policy on informed consent procedures for photography in the clinical setting would be included. This would aid in assessing whether there is a need for further education regarding health professional's responsibilities to patient confidentiality if it is found that they are engaging in clinical photography using mobile phones.

1.2 Research question and aims

Given the lack of data available about mobile phone ownership amongst health professionals in NZ and their frequency of use as a photographic tool in the healthcare setting, the research question was: What is the risk to safety and confidentiality in light of advancing mobile technology for patients undergoing hospital treatment in New Zealand?

The research aims were:

- Research Aim 1: To survey to use of mobile phones by health professionals to photograph patients' body parts/organs or confidential patient information in the clinical setting of a DHB.
- Research Aim 2: To explore the perceptions and attitudes of health professionals in regard to local policy.

The overall aim of this study was to show whether there is a need to update current local policy for consent for clinical imaging. Updates in policy would provide clarification for health professionals surrounding their responsibilities in maintaining the confidentiality of patient images in the current technological era and thereby reduce the risk to patient safety and confidentiality.

1.3 Background to the problem

1.3.1 Current prevalence of mobile phones.

Mobile phones have evolved into more than just text and voice communication devices, which was their sole purpose when introduced into common use over thirty years ago. Today's mobile phones are capable of much more. From storing large personal libraries of music, playing movies, managing multiple email systems, facilitating online social networking, downloading a multitude of applications (apps), Internet access. Essentially, today's mobile phones or 'smartphones', serve as miniature personal computers in a far more compact, convenient and capable format than the desktop versions first introduced for household usage in the 1980s (The Economist, 2009). According to other sources,

The smartphone is the most personal of consumer electronics devices: the most constant companion, the most personal of choices, the most customised and reflective of the owners, the least likely to be shared with other users and the most frequently looked at (Deloitte, 2015, p.43).

This means that information can be sourced, uploaded and circulated to millions of people instantly from the touch of a button.

As of 2015, 72% of the NZ population owns or has access to a mobile phone/smartphone, which is nearly a 50% increase on 2013 figures (Research New Zealand, 2015). Reports from the United Kingdom (UK) suggest that as many as 81% of British doctors owned smartphones in 2011 (Ofcom, 2011; Devices 4 Limited, 2010). A survey looking at smartphone ownership amongst health professionals in the United States (US) and Europe between 2010 and 2012 showed that ownership had increased 91% in those two years for US health professionals and to 81% for their European colleagues (EPG Health Media, 2012). These figures are now a few years old and have likely risen since that time. No data were found to show NZ health professional's ownership of mobile phones/smartphones.

1.3.2 Photography as a clinical tool

Clinical photographs are comparable to x-rays in that they facilitate treatment (Berle, 2008) and become part of the patient's confidential clinical record. According to NZ legislation, health professionals have a duty to maintain the confidentiality of all information that they gather about a person's health (Privacy Commissioner, 2008). The relationship that exists between patient and the health professional whose skills and experience they are relying on is one based on trust (Hall, Dugan, Zheng and Mishra, 2001; Ridd, Shaw, Lewis and Salisbury, 2009). Health professionals are bound by codes of professional conduct and ethics, which stipulate that information gathered about patients should be treated with confidentiality and utilised only with informed consent for professional purposes (Nursing Council of New Zealand, 2012; Medical Council of New Zealand, 2014). Therefore, a reported breach of the health consumer's confidentiality would force a review by the Health and Disability Commissioner and in more serious cases, review by the relevant regulatory organisation (HDC, 2009a).

Like any other investigation being undertaken in the hospital setting, patients need reassurance that the safety and regulation of patient images is maintained through a combination of that trust relationship and documentation that outlines exactly what, when, where, how and by whom the procedure will be performed. The benefits of photography in assisting the delivery of healthcare are not under question here. Although the photographic recording of patients is not therapeutic in itself, it has the means to facilitate the treatment process and assist with decisions surrounding the options for suitable treatment (Berle, 2008). Ethical consideration is imperative and there are numerous studies and documents supporting the need for guidelines when photographing patients (Berle, 2008; Bhangoo, Maconochie, Batrick, and Henry, 2005; Burns and Belton, 2013; Devon, 2013; Kirk, Hunter-Smith, Smith and Hunter-Smith, 2014; Mji, Schneider, Vergunst, and Swartz, 2014; Taylor, 2013; Taylor,

Foster, Dunkin and Fitzgerald, 2007). These authors reinforce the importance for health professionals to recognise patients' rights to dignity and privacy throughout their care and treatment. This is especially important in cases when visual recordings may identify them or are of body parts that the patient may not want others to see at a time when they are most vulnerable and which have the potential to embarrass or humiliate them. Whilst patients may recover from illness, injury or disease, photos are a permanent reminder (Burns and Belton, 2013).

1.3.3 Ethics of medical photography

1.3.3.1 Medical Photographers

The photographic recording of clinical conditions for patients' confidential medical records is the main role of the medical photography professional (Institute of Medical Illustrators, n.d.a). Photography usually takes place either in a studio environment, the ward or clinic setting or within operating theatres with the consent of the patient involved. These photographs are used predominantly as a diagnostic tool providing visual documentation of a patient's illness or injury, sometimes at various stages over a period of time (Institute of Medical Illustrators, n.d.a). Patient photographs may also be taken for teaching, education and/or publication purposes and additional consent from the patient is required for such (Institute of Medical Illustrators, n.d.a).

Medical Photographers belonging to the Institute of Medical Illustrators, are guided by a Code of Professional Conduct (Institute of Medical Illustrators, 2014a). Based in the UK, this organisation represents photographers, videographers, designers and artists working in the healthcare sector both in the UK and internationally (Institute of Medical Illustrators, n.d.b). The organisations guidelines hold it's members to a high standard of professional and ethical practice and any violation of the Code constitutes penalties from the governing body. Institute of Medical Illustrator's guidelines are replicated in policy documents of many NZ and international health institutions.

Whilst it is not a necessity for a Medical Photographer to become a registered member, it is beneficial for maintaining international integrity and quality of the profession. Members are held accountable for ensuring that patients are not subject to harm or suffering (Institute of Medical Illustrators, 2014a). They must also show recognition and respect for patients' cultures, beliefs and rights to dignity. This is important throughout all stages of contact with the patient and in the handling of their images (Institute of Medical Illustrators,

2014a). Medical Photographers have a duty of care that includes ensuring that appropriate and informed consent specific for the purposes of the images has been obtained (Institute of Medical Illustrators, 2014a). This must be presented to patients using understandable language so that they can make an informed, appropriate decision with regard to their own care. Most healthcare institutions have a requirement for patients to provide informed consent in a written format and as such have their own consent forms that allow the patients to select and sign for the level of consent that they wish to provide (Institute of Medical Illustrators, 2014a). For example, depending on the nature of the photographs, some patients may not be agreeable to allowing their photos to be published. This would be specified on the consent form confirming that the images will not be used for this purpose and it should be made clear that patients do have the right to refuse consent for any reason.

Principle Three of the NZ Privacy Act 1993 (Privacy Commissioner, 2013) does not require that written information be provided to consumers for the purposes of collecting personal information. However, it does state that if there are a number of details involved in the reason for collecting information (including photographic or video recordings) it is reasonable to have it in a written format so that both the organisation and the individual (the patient) can refer retrospectively, ambiguity can be prevented and disputes can be easily settled should they arise (Privacy Commissioner, 2013). Written informed consent is considered 'best practice' amongst the medical photography profession (Institute of Medical Illustrators, 2014).

1.3.3.2 Health Professionals

For health professionals choosing not to utilise the expertise of a professional Medical Photographer and instead using a personal mobile device such as a mobile, personal digital camera or any such electronic device with photographic capabilities, Principle Three of the NZ Privacy Act 1993 also applies in the same way (Privacy Commissioner, 2013). What is

considered to be ‘best practice’ for the medical photography profession is similarly reflected in some (but not all) of NZ’s DHB informed consent policies. Nationwide uniformity of ethical photographic practice in the clinical setting is vital for keeping both staff and patients safe; for protecting their right to privacy; their right to make an informed choice and give informed consent (Health and Disability Commissioner, 2009b). However, this uniformity of local policy has not yet been achieved.

1.3.4 The use of mobile phones in the clinical setting

In the health arena, mobile phones are heavily relied upon for communication by health professionals especially (Wu, Morra, Quan, Lai, Zanjani, Abrams and Rossos, 2010; Wu, Rossos, Quan, Reeves, Lo, Wong, Cheung and Morra, 2011; Koehler, Vujovic and McMenamin, 2013) and have become valuable tools in education (Boyce, 2012). As noted in Chapter 2 of this dissertation, mobile phones are being used for their camera capabilities in delivery of healthcare (Taylor, et al., 2007; Burns and Belton, 2013; Kirk et al., 2014). According to reports from National Health Trusts in the UK, clinical photography managers have come under pressure to “authorise, endorse or manage” images that have been captured on mobile phones belonging to health professionals (Institute of Medical Illustrators, 2014b, p. 2). In NZ, the extent to which mobile phones are being used for clinical photography is not yet known but anecdotal reports from medical photography professionals (Medical Illustration Clinical Manager, personal communication, June 4, 2015) indicate that an increasing number of non-medical photography trained health professionals are using their mobile phone cameras for this function.

The image quality of cameras in mobile phones has advanced significantly since they were first integrated as a standard component. For example, features of the iPhone 6 include an 8-megapixel camera, which has automatic image stabilisation and exposure control (Apple Inc., 2015) making it a very capable and handy point-and-shoot camera for most amateur

photographers. Hence, the ease of usability of mobile phones has allowed health professionals to routinely capture clinical images of an acceptable quality to aid diagnosis and treatment (Kirk et al., 2014; Oakley, 2015).

The technological capability available to health professionals can certainly benefit the speed and accuracy of patient care significantly. However, the movement of that image on the health professional's mobile phone once it has been transported off the hospital site should be considered. With personal devices there is a greater risk that patient information will be transported out of the hospital environment, could potentially land in the wrong hands and be used inappropriately for purposes other than they were meant (Burns and Belton, 2013). Once the photo has been taken, patients need reassurance that their images (which are often of a sensitive and personal nature) will be managed and stored in an appropriate manner as to prevent them from falling into the hands of unintended viewers (Burns and Belton, 2013).

1.4 Chapter summary

There is a greater privacy concern for use of mobile phones with camera functions compared to using dedicated digital cameras. This is because, unlike digital camera, mobile phones have advanced abilities that allow them to connect to the internet and send information to anywhere in the world using a variety of communication avenues such as Multi-media Messaging, email, social networking websites, mobile apps to name a few (Institute of Medical Illustrators, 2014b). With such extensive connectivity there are increasing risks that security could be breached in personal devises belonging to health professionals (Institute of Medical Illustrators, 2014b). It is clear that security issues of mobile phones needs to be addressed to prevent people from outside the immediate healthcare team from viewing highly sensitive patient information.

Regardless of whether there is an authorised Medical Photographer present taking the images or if the images are taken by the health professional using a dedicated camera or mobile phone, policy must be clear and understandable for health professionals of all disciplines. Any policy would need to address informed consent procedures, image ownership, methods of safe and ethical image recording (encompassing all types of electronic devices with camera capabilities), image storage, methods of secure image sharing and provide a clear outline regarding penalties for non-compliance (Berle, 2008; Burns and Belton, 2013, Institute of Medical Illustrators, 2014b).

In the next chapter there will be a review of literature found using nursing, medical and allied health journal databases.

2 Literature Review

2.1 Chapter introduction

Due to the contemporary nature of the issue, research papers and reviews were sought from the past ten years using CINAHL and Medline® looking specifically for information about mobile phone or smartphone and personal digital device usage by health professionals. These databases were used because they contain the largest collections of studies related to nursing, medical and allied health from around the world (Elton B. Stephens Company [EBSCO], 2016; United States National Library of Medicine, 2015). Three studies were identified and reviewed in English (Burns and Belton, 2013; Kirk et al., 2014; Taylor et al., 2007). These particular studies were relevant to this dissertation because they all contained quantitative data relating to the use of digital devices (mobile phones/smartphones; hospital-owned cameras; personal digital cameras) for taking photographs in the clinical setting and were based on results from nursing and medical professionals. No studies were found pertaining to allied health professionals use of digital devices for photographic capture in the clinical setting. Details concerning the authors, the countries the studies took place in, research methodology and response counts can be found in Table 1.

Table 1: Comparison of literature

	Kirk, Hunter-Smith, Smith and Hunter-Smith	**Burns and Belton**	**Taylor, Foster, Dunkin and Fitzgerald**
Year	2014	2013	2007
Location	Victoria, Australia	Northern Territory, Australia	Sheffield, United Kingdom
Methodology	Quantitative	Quantitative and qualitative	Quantitative
Technology studies	Smartphones	Hospital-owned cameras, personal cameras, mobile phones	Hospital-owned cameras, personal digital cameras
Study sample	Medical students and all doctors	Doctors and nurses from selected departments	Plastic surgeons at 3 hospitals
Sample size (*n*)	409	738 (151 doctors, 587 nurses)	60
% Response rate	32%	23% (+ 8 interviews)	70%
% respondents that took their own clinical images	65%	48%	71%

2.2 Comparativeness

Studies across in the UK and Australia (see Table 1) have shown that health professionals are using digital devices to take images of patients in the clinical setting. Given the limited number of published studies on this emerging issue, the results seen in these studies may not be representative of health professionals in other countries or hospitals as the research methodology, sample sizes, demographics and technology being examined are quite varied. No NZ studies were located. Therefore, the use of mobile phones or other personal digital devices for photography in the NZ hospital setting is unknown.

2.3 Consent

In the study by Taylor et al. (2007), it was noted that 13 out of 22 surgeons obtained written consent for taking clinical photos for the purpose of documentation in the patient records. Out of the 23 surgeons who confirmed having taken clinical images for publication purposes, 13 of them had a written record of the agreement. Burns and Belton (2013) noted that 61.8% (n=42) of respondents who took photos for the clinical record always gained their patient's consent (verbal, written, third-party) to take photographs. However, only 16% (n=11) of those respondents documented it in a written format. The most common form of consent was verbal (65.7%, n=46). Kirk et al. (2014) found that of 76% (n=102) of clinicians, who reported gaining consent, 7% (n=7) had obtained it in a written format and 22% (n=22) documented their actions in the patient's medical record.

It is evident that the health professionals in these studies are aware that they have an obligation to gain the consent of some form from their patient to obtain photographs. However, many did not gain required written consent. This may be because they had either chosen to ignore the policy of their healthcare institution or they simply are unaware of medical photography policy.

2.4 Image storage and sharing

There appeared to be a major lack of clarity amongst health professions in all three studies as to how photographic images taken in the clinical setting were to be managed once they were captured on digital devices. In the most recent study by Kirk et al. (2014), more than half of doctors reported keeping the images that they took on their mobile phones, and the majority of those kept were retained on the smartphone device itself. In contrast, Burns and Belton (2013) reported that the majority of respondents preferred to print photographs for the patient file or stored them on the hospital server. They found that a much smaller proportion of respondents stored images on their mobile phones or other personal digital devices or hard drives.

All studies included in this literature review agreed that storage of patient images was of concern because they either did not feel that they had adequate knowledge as to how to label or where to store or discard of the photographic data (Taylor et al., 2007; Burns and Belton, 2013; Kirk et al., 2014). In Taylor et al. (2007), the majority of surgeons downloaded and stored images from their digital camera to their personal computers and laptops. Whilst not specifically addressing mobile phone photography, the results of this study are still applicable to the issue at hand. This is because with whatever type of personal device is being used to photograph and store images of patients or patient information, health professionals have made a choice not to utilise the professional expertise of a Medical Photographer. By choosing to take the photographs themselves, health professionals of all disciplines take on the same ethical and professional responsibilities that professional Medical Photographers are bound to, whether they realise it or not (Taylor et al., 2007, Institute of Medical Illustrators, 2014b).

Neither Burns and Belton (2013) or Taylor et al. (2007) made note of image sharing methods. However, Kirk et al. (2014) stated that physically showing images to other clinicians on the mobile device was the most common means of sharing amongst its respondents. Other

methods mentioned were multi-media messaging and email but there were no specific figures available to illustrate this. The upload of clinical images to a social networking website was stated by one respondent (Kirk et al., 2014). It should be noted that in NZ, there are efforts being made by the New Zealand National Health Information Technology Board to formulate secure information delivery systems that health professionals can use nation-wide (Hospital Paediatrician, personal communication, September 29, 2015).

2.5 Image ownership

Health professions in these studies appeared to have a lack of knowledge and awareness of their local institution's photographic imaging policy on image ownership. Less than a fifth of respondents in Burns and Belton's (2013) study were aware that the hospital retained ownership of any images taken. In three plastic surgery departments across three UK hospitals, 19.8% (n=33) of respondents were correct in stating that image ownership was retained by the health department. Kirk et al. (2014) found that 57% (n=76) of respondents were unaware that a clinical imaging policy existed. The majority of respondents had the impression that the patient owned the photos when it was actually the hospital or employer that retained image ownership (Kirk et al., 2014).

Given that evidence from these studies indicated a high proportion of health professionals are using their mobile phones and other personal devices to take clinical images of patients, this raises legitimate concerns. Evidence would suggest that most health professionals in these studies either were not aware of their hospital's image ownership policy, or had not understood it. With health professionals now having the ability to capture and store images on personal devices as opposed to using hospital cameras or official Medical Photographers it may be much more common for them to assume ownership belongs to them. This is question that requires exploring in NZ, as there is no data currently available to answer it.

2.6 Chapter summary

It has been suggested that use of mobile phones for obtaining photographs of patients in the hospital environment is actually higher than is suggested from the figures in these studies (Burns and Belton, 2013) as results relied on health professions volunteering the information and the sensitivity of the topic itself could make people unwilling to do so.

There is a lack of NZ research on this topic and unfortunately there have already been a number privacy breaches of patient records and medical images (Torrie and King, 2013; New South Wales Nurses Association, 2008; Scott, 2015). These types of incidents indicate that privacy may be poorly adhered to by some health professionals and that legislation and guidelines are either ignored or under recognised. Calls for more studies of this nature have been made by researchers (Kirk et al., 2014; Burns and Belton, 2013) to find out whether this was a local or global issue. Therefore, this study will add NZ data about this recent phenomenon.

The methodology used in this study is described in the next chapter.

3. Methodology

3.1 Chapter introduction

This chapter firstly describes the research design and the advantages and disadvantages of the method chosen for use. It then outlines alterations that were made to the original study on which this was based. Ethical considerations are described and a description of the sample group and data collection methods are provided.

3.2 Research design

This research was a replication study based on a survey conducted by Kirk et al. (2014) via an online survey (Appendix B). The results of that study enabled the researchers to produce a descriptive analysis of an Australian hospital sample that showed smartphone ownership, image use and image storage. In addition, attitudes and awareness of local photographic policy were highlighted. The aim of this study was to descriptively explore the topic in a New Zealand context.

3.3 Ethical Considerations

3.3.1 Ethical consent

The topic under investigation is of a sensitive nature. Therefore, before the project could take place, ethical approval was sought from the University of Canterbury Human Ethics Committee (HEC). This was obtained on September 16, 2015 (HEC 2015/81/LR) (Appendix C). Following this, permission was obtained from the Executive Directors of Nursing (Appendix D) and Allied health (Appendix E), the Chief Medical Officer (Appendix F). Final approval was obtained from the Research Office (Appendix G) and the Maori consultation group (Appendix H) of the DHB being researched on September 24, 2015 prior to distribution of the email asking for participants (Research Office No. 15173).

All relevant authorities were satisfied that the anonymity and safety of participants had been appropriately taken into account and that the methodology was suitable for the purpose intended. As stated in the ethics application to the HEC, the name of the DHB where the research took place was not to appear in the final report and would instead be referred to

throughout as the local DHB. The only alteration made to the application was a request from the UC Human Ethics Committee stating that the data should be stored securely and indefinitely as part of national health data.

3.3.2 Accessing the sample

The researcher had permission to utilise the DHB's electronic phonebook to email potential participants with an invitation to take part (see appendix K). Once this process had been completed no identifying information was saved or stored. Participation in the survey was anonymous and responses were non-identifiable. It was not possible to track which people had clicked on the survey link after receiving an email. Reminder emails were therefore not selective of those who had or had not participated. Participants could also be reassured that no identifying information would be made available in subsequent research reports.

Every participant was provided with an information page prior to commencing the survey questions. This page informed the participant about the purpose and aim of the project and included contact details of the lead researcher and supervisor where they could have the opportunity to ask any questions or send any concerns or feedback. The complaints procedure via the UC Human Ethics Committee was also provided and all participants were informed that they had the right to withdraw at any stage before the end of the survey. Once the participant had clicked the 'Submit' button at the end, their responses were irretrievable and answers were unable to be altered from this point.

3.4 The survey tool

3.4.1 Choosing the survey tool

There were few appropriate survey tools located in the literature. The survey used by Burns and Belton (2013) required both quantitative data collection via paper questionnaires and qualitative interview data with eight staff members. Whilst the topics covered in this research were applicable to the aims of this study, the method of data collection would have required greater funding and time than was attainable for this project. The other method considered was from the Taylor et al. (2007) study. Whilst this survey covered important topics such as consent, image ownership and data protection, the method was unsuitable as it researched the general practice of taking photographs in the clinical setting rather than specifically the use of mobile phones.

3.4.2 Advantages of online surveys

Because eligible respondents were spread across multiple DHB sites, online access to the questionnaire was considered the quickest, easiest and most cost effective method of distribution (Couper, 2000; Couper and Miller, 2008). The purpose of this survey was to capture a 'snapshot' of mobile phone photography practice at a single point in time and for this the online questionnaire was well suited. It enabled a large number of responses to be collected in a short space of time.

As the topic of the study was of a sensitive nature, the ability to take the questionnaire online as opposed to face-to-face interviewing methods allowed respondents to remain anonymous as well as providing the convenience of being able to complete it at a time and in a location of their choice. Anonymity allowed respondents to more openly self-report their behavior thereby reducing the likelihood of social desirability bias (Tourangeau, Rips and Rasinski, 2000). Validity of the results was sustained via this method because it enabled participants to provide more accurate and truthful answers in less pressured circumstances than in a face-to-face interview or a telephone interview for example (Kreuter, Presser and Tourangeau, 2008).

3.4.3 Disadvantages of online surveys

Any research method has its disadvantages. In the case of this online survey, delivery via email relies upon potential respondents to be regularly accessing their email accounts. This was a concern noted by Sax, Gilmartin and Bryant (2003) to affect response rates compared with paper-based surveys. To improve response rate, potential participants were sent email reminders and an advert calling for participation was placed in the local DHB's weekly newsletter and daily internal communication emails. Participatory encouragement was also delivered via email by the local Hospital Medical Specialist Association to its members (Appendix I).

The time commitment required to take the survey may potentially deter respondents from completing all questions (Sax el at., 2003). To counteract this, participants were informed at the beginning of the survey approximately how much time the questionnaire was expected to take to complete and that they may not have to answer all questions depending on their answers. Additionally, throughout the survey a progress bar was visible at the top of the screen to provide reassurance of progress.

3.5 Adaptation of the original questionnaire design

The original questionnaire (Appendix B) utilised in the study by Kirk et al. (2014) required some minor alterations prior to distribution to the sample group. Changes (as noted in sections 3.5.1 and 3.5.2) were made to fit it into the NZ context and the difference in sample group composition. The aim of this was to enable potential participants to better understand what the questions were asking so that ultimately they could provide more accurate and truthful responses.

3.5.1 Terminology changes

Terminology changes included use of the word 'smartphone'. This was replaced with 'mobile phone' as it was decided after discussion with the study supervisor that 'smartphone' may not be a term that was understood across all age ranges. It was possible that the term 'smartphone' might have deterred some people from taking the survey if they did not consider their phones to be classified as such. 'Mobile phone' was agreed upon as a more universal term.

Omission of the words 'Peninsula Health' was necessary as this project was based in a different setting. It was replaced with 'your DHB' as opposed to the name of the DHB that was involved with the research. This was done firstly to maintain the anonymity of the institution and its employees and secondly to make the survey usable to other DHBs, should it be repeated elsewhere.

The term 'medical images' was replaced with 'photographs of patients, body parts/organs or medical notes'. This change was made to define more explicitly what kinds of images could be defined as medical in nature. Anecdotal evidence from small number of DHB staff members prior to the commencement of this study, suggested that the taking of photographs in clinical environments was not restricted just to taking pictures of the patient themselves. Nursing and medical staff had observed instances of the photographic capture of patient information and medical notes. Therefore it was deemed necessary to define this to

potential participants as clearly as possible thereby increasing the validity and accuracy of self-reported photography practices in the workplace when questioned in the survey.

The word ‘clinician’ was replaced with ‘health professional’. This was altered because the original study focused on medical staff and students whereas this study was aimed at medical, nursing and allied health staff. ‘Clinician’ traditionally is used to refer to doctors whereas the term ‘health professional’ more accurately encompassed all of the three professions under one umbrella.

3.5.2 Question adaptions/changes

The original survey asked respondents to name their current position at their place of employment. This was removed for this study because it was deemed that by including this information alongside information about age range, gender and area of work, respondents would be at risk of being identified. The inclusion of age range data meant it was possible to estimated the approximate career level of respondents.

The original study was design for medical staff and medical students. However, for this study, the researcher and key stakeholders were interested in collecting data from DHB employed nursing, medical and allied health staff. This did not include students of any discipline. Because of this difference in sample group composition, respondents were additionally required to answer an extra question about whether they were medical, nursing or allied health affiliated so as to enable the researcher to group respondent data into to these three categories during the analysis phase and provide comparisons between health professions.

A Likert scale was added to Question 14 (Appendix J) regarding whether health professionals recorded that they had taken images of patients, body parts/organs or medical notes in the course of their employment with the DHB in a clinical capacity. This replaced the previous options (Question 12, Appendix B). The change meant that respondents could report

variation or consistency in their practice. The Likert scale provided a means of ascertaining in-depth data about this concept.

The final version of the questionnaire was reviewed by the researcher's supervisor, the University of Canterbury Human Ethics Committee and the Research Office at the DHB where this study took place and was determined to be appropriate for the aims of the research question.

3.6 The finalised questionnaire

In total there were 36 questions divided into 9 sections asking respondents to report on the following (Appendix J):

1. Demographics
2. Mobile phone ownership
3. The characteristics of mobile phones
4. Mobile phone photography practices
5. Sharing of identifiable images
6. Sharing of non-identifiable images
7. Images shared with the respondents
8. The reasons why staff take photographs using their mobile phones
9. Awareness and understanding of local policy

Every participant was provided with information outlining the research question and aim of the study. They were assured that their participation was entirely voluntary and that they were under no obligation to take part of complete the questionnaire. If they agreed to the terms of participation, they were then logically guided through the survey to the final page, which thanked them for their contribution. Depending on their individual responses given throughout the course of the questionnaire, participants may or may not have had to answer all 36 questions. For example, if a participant had stated in Question 10 that 'No' they had never taken photographs of patients, body parts/organs or medical notes using a mobile phone at any DHB hospital site, then they would have automatically skipped the following five questions as they did not apply.

3.7 Sample group

3.7.1 Inclusion and exclusion criteria

All nursing, medical and allied health staff employed by the DHB were eligible to participate in the survey. Students were excluded as they are not defined as DHB employees until fully qualified and practicing under a contract with the DHB.

3.7.2 Recruitment

Participant recruitment was sought through a variety of channels. The Human Resources department provided permission for the researcher to access the DHB internal electronic phonebook (Appendix K). From this database, the researcher searched for suitable participants using key words and from this compiled a list of staff email addresses.

Key search terms included: nurse; RN; EN; registered nurse; enrolled nurse; nurse practitioner; nurse educator; clinical nurse educator; CNS; clinical nurse specialist; CNM; clinical nurse manager; doctor; registrar; house officer; SMO; senior medical officer; medical officer; house officer; specialist; consultant; clinical director; audiologist; dietician; occupational therapist; OT; play specialist; psychologist; pharmacist; physiotherapist; speech and language therapist, SLT; social worker.

This sampling method was used to ensure that as many staff members as possible were directly notified about accessing and participating in the study.

In total, the recruitment system culminated in a list of 2442 nurses, 621 medical staff and 706 allied health staff. To ensure that the survey reached as many of these nursing, medical and allied staff members as possible, the Survey Monkey® link was emailed directly to all 3769 staff members on the email list. On days one, eight and fifteen of the data collection period, these staff members were each sent an email inviting them to participate with the link to the online questionnaire (Appendix L).

Other recruitment avenues included:

- An advert published via the Communications department on a weekly basis in the local DHB newsletter, which also featured in the daily internal staff communication email (Appendix N).
- The local Medical Specialist Association sent a request to its members encouraging participation (Appendix I).

3.8 Data collection

Questionnaire responses were collected through Survey Monkey® over a three week period. The survey was opened for participation from Monday 24th September 2015 and closed at midnight on Friday 16th October 2015.

3.9 The setting

The DHB's email system allows off-site access to staff members and as the survey was online, participants were able to access it on their own devices or via DHB-owned computers at a time and place of their choosing. Studies by Horizon Research (2014) illuminated that people with a professional qualification or who worked for the government were most likely to own a smartphone device. Medical, nursing and allied health professionals fall into this category therefore it was reasonable to assume that they will have access to a computer of some form whether at home or at work to be able to take the survey. Computers with Internet access are also found in all departments across the various hospital sites of the DHB involved with this research.

3.10 Validity

Answer options and units of measure were consistent with the survey in Kirk et al. (2014), except where noted in section 3.5. No statistical analysis was performed, as this project was an exploratory, descriptive study. The researcher's supervisor reviewed the survey content. This was necessary to ensure there was consistency with the original study, objectivity was maintained and that the questionnaire content was suitable for answering the research aims.

3.11 Data analysis

All quantitative data were exported to and analysed using Microsoft Excel Version 14.4.4. Some descriptive datum was recoded where necessary if participants had written a response that matched what was already visible in the list of answer options provided.

3.12 Chapter summary

Once the researcher had approval from the Human Ethics Committee, the online survey was distributed to potential participants via email. Questions were posed to survey the use of mobile phones by health professionals for photographing patients' body parts/organs or confidential patient information in the clinical setting of a DHB. Secondly, the survey explored the perceptions and attitudes of health professionals in regard to the DHB's informed consent for imaging policy. The survey was divided into nine sections asking for information about respondent demographics; mobile phone ownership; the characteristics of their mobile phones, sharing of identifiable images, sharing of non-identifiable images, images shared with respondents, reasons for taking photos using mobile phones and awareness and understanding of local policy.

The next chapter will provide an outline of results received from respondents.

4 Results

4.1 Chapter introduction

On completion of the survey period, the raw data were exported to a Microsoft Excel format. This provided the results outlined below. The first part of this chapter details the response rate and the demographic characteristics. The second part provides a descriptive analysis of the quantitative data collected. Responses were linked to the two research aims.

4.2 Response rate

An email invitation was sent to 3769 DHB staff members who were eligible to participate according to the criteria outlined in section 3.7.1. This included 2442 nurses, 621 medical staff and 706 allied health staff. Of the 3769 health professionals that were sent a link to take part in the survey, 28.8% *(n*=1085) responded. Of those 1085 responses, there were 134 participants who either did not qualify to take part due to identifying as belonging to a profession other than nursing, medical or allied health or they had not complete the entire survey and logged off before the end of the questionnaire. These responses were removed and from this the completed survey response rate was calculated to be 25.2% (*n*=951).

In total, 22.3% of nursing staff, 28% of medical staff and 33% of allied health staff that were sent the invitation email responded to the survey.

4.3 Participant demographics

As displayed in Table 2, the majority of respondents (83.4%, *n*=793) were female with the number of male employees being significantly lower at 16.3% (*n*=155). The majority of nurses that participated were female (90.3%, *n*=491) as were 89.3% (*n*= 208) of allied health respondents. Medical respondents were 54.0% (n=94) female and 46.0% (n=80) male.

The majority of respondents were between age ranges 25-64 across all sample groups (Refer to Table 2 for more detail).

Table 2: A comparison of gender, age range and area of employment of respondents.

		Nursing	Medical	Allied Health	Total
Total completed surveys *n* (% of responses)		**544 (57.2)**	**174 (18.3)**	**233 (24.5)**	**951**
Gender *n* (% of responses)	**Male**	50 (9.2)	80 (46.0)	25 (10.7)	**155 (16.3)**
	Female	491 (90.3)	94 (54.0)	208 (89.3)	**793 (83.4)**
	Other	1 (0.2)	0 (0.0)	0 (0.0)	**1 (0.1)**
	Prefer not to say	2 (0.4)	0 (0.0)	0 (0.0)	**2 (0.2)**
Age range in years *n* (% of responses)	**<25**	54 (9.9)	3 (1.7)	13 (5.6)	**70 (7.4)**
	25-34	119 (21.9)	58 (33.3)	69 (29.6)	**246 (25.9)**
	35-44	90 (16.5)	47 (27.0)	49 (21.0)	**186 (19.5)**
	45-54	170 (31.2)	35 (20.1)	54 (23.2)	**259 (27.2)**
	55-64	100 (18.4)	24 (13.8)	43 (18.4)	**167 (17.6)**
	65 and over	11 (2.0)	7 (4.0)	5 (2.1)	**23 (2.4)**

The majority of respondents (57.2%, *n*=544) were nurses; medical staff made up the smallest proportion of respondents (18.3%, *n*=174); and a quarter identified as allied health staff (24.5%, *n*=233). The areas of employment for nurses and doctors are outlined in more detail in figures 1 and 2. Key findings included:

- Surgical nurses comprised 20.6% (*n*=112) of total nursing responses, 18.7% (*n*=102) of nursing staff in the sample group identified as working in mental health and addictions and 9.9% (*n*=54) indicated that they worked within general medicine.
- 'Other' responses received from nursing staff included specialisation in palliative care, radiology, management, gastroenterology or joint affiliations with two specialities such as cardiology/nephrology or medical/surgical which respondents did not feel fitted with any of the options presented to them.
- Most medical respondents worked in a surgical capacity (19.5%, *n*= 34), mental health and addictions (12.6, *n*=22) or in general medicine (12.1, *n*=21).

- ‘Other’ responses included participants from dermatology, sexual health, pain, haematology and hyperbaric medicine, genetics, gastroenterology, palliative care, older person’s health, rural medicine and research.

The occupational groups for allied health respondents are detailed in Figure 3. Key findings were:

- The highest response rates were from occupational therapy (22.7%, *n*=53), physiotherapy (18.9%, *n*=44) and social work (18.5%, *n*=43).
- ‘Other’ responses identified were from occupations such as radiation therapy and anaesthetic technology.

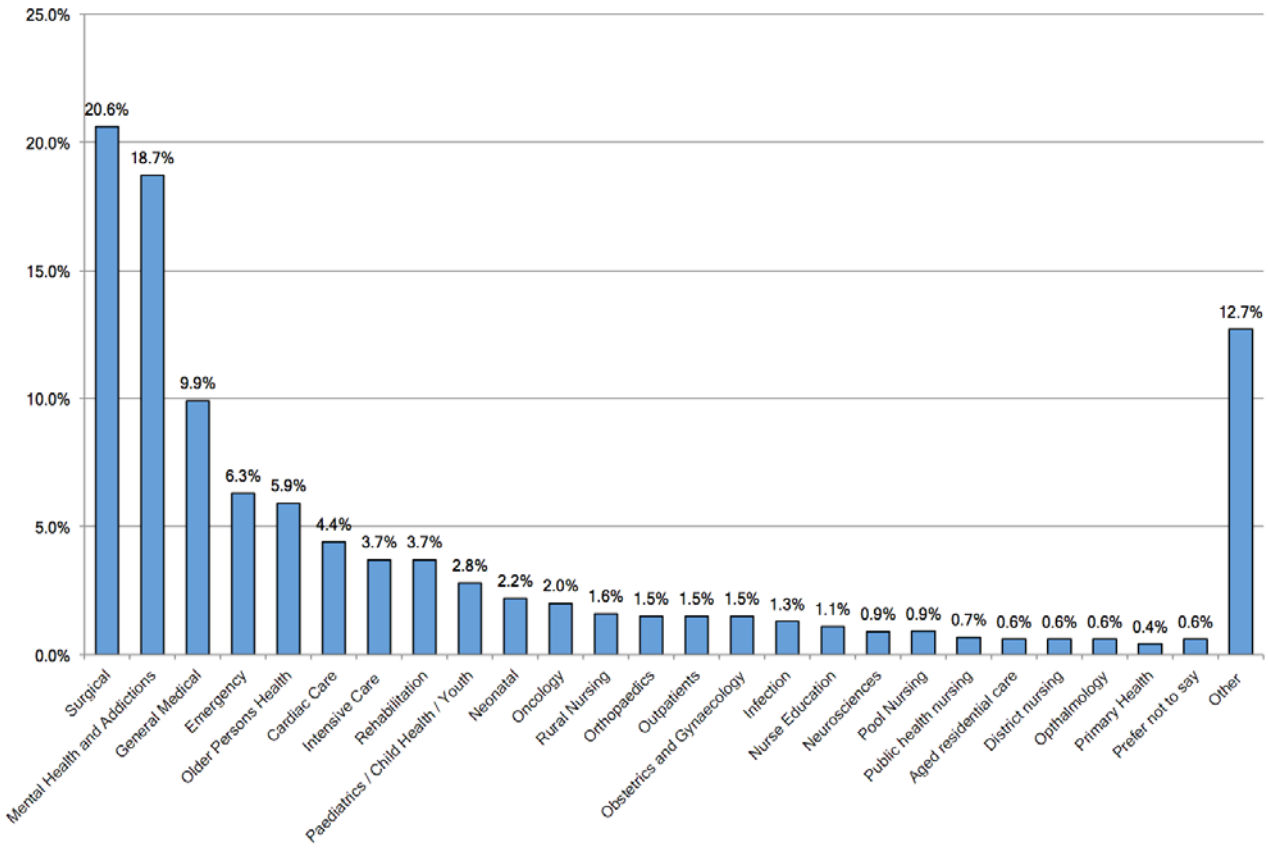


Figure 1: Areas of employment of nursing staff (*n*=544).

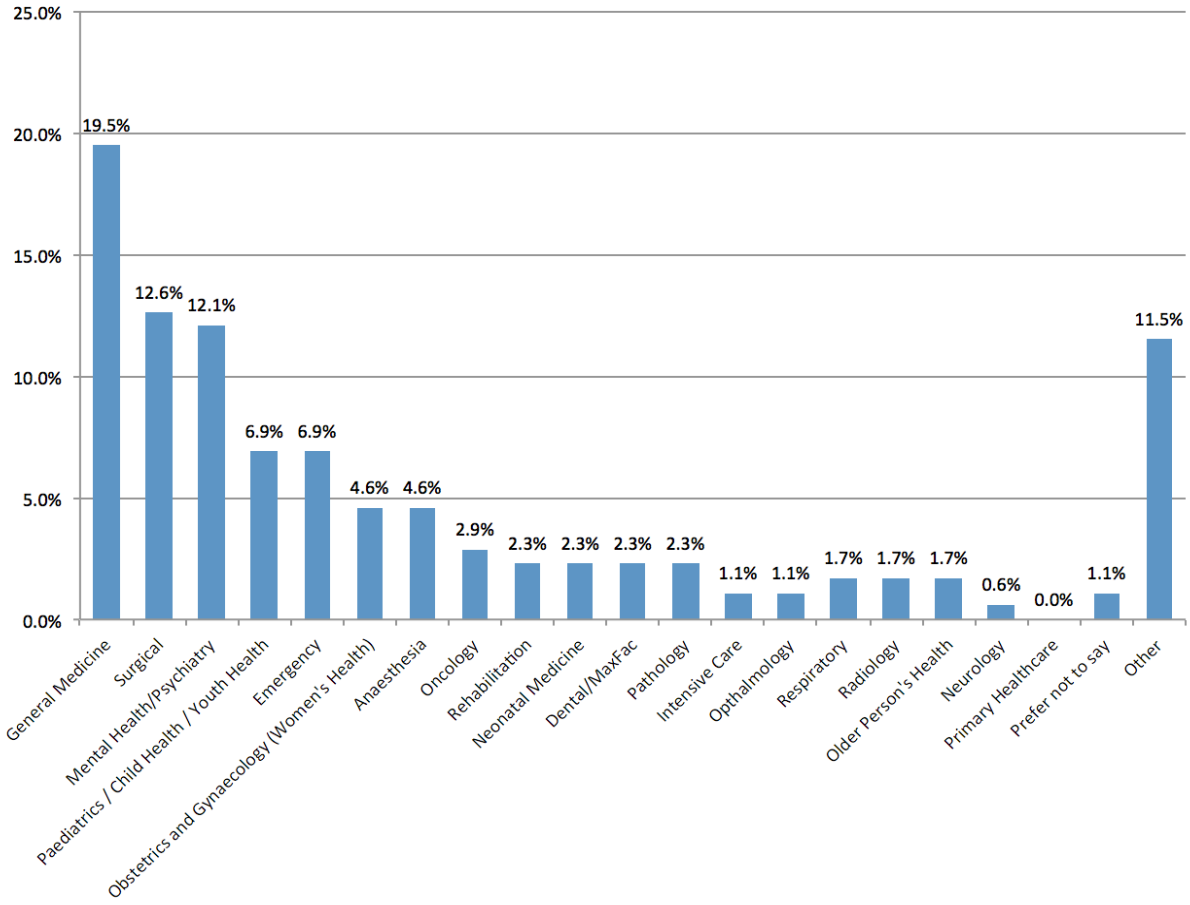


Figure 2: Areas of employment of medical staff (*n*=174)

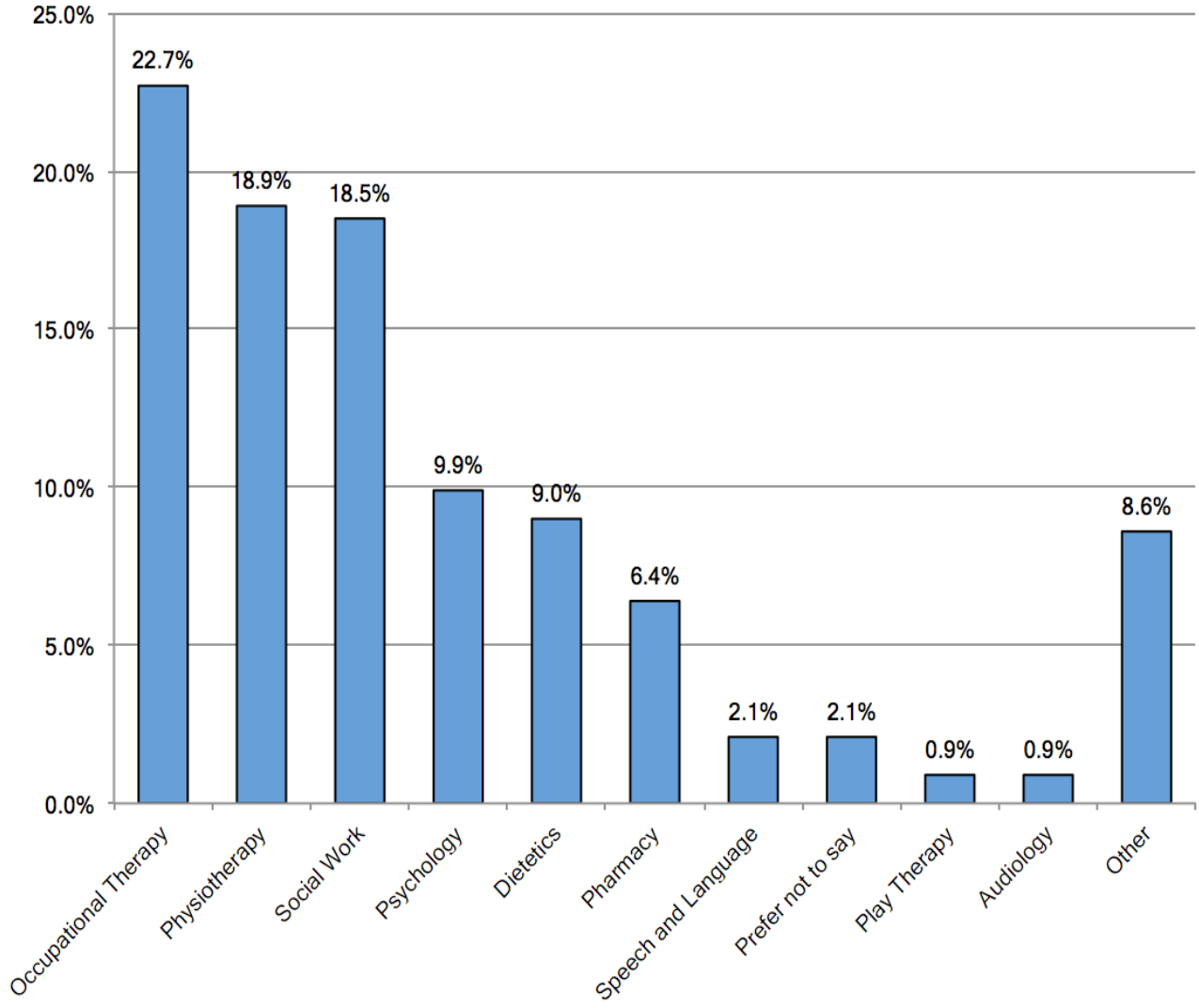


Figure 3: Occupational group of allied health staff (*n*=233).

4.4 Research aim 1: To survey to use of mobile phones by health professionals to photograph patients' body parts/organs or confidential patient information in the clinical setting

4.4.1 Mobile phone ownership and characteristics.

Respondents were asked four questions related to mobile phone ownership: 1) Did they own a mobile phone? 2) Did the mobile phone have a camera function? 3) Was the mobile phone connected to the Internet? and 4) Was the mobile phone password/PIN protected?

Results showed that the majority of respondents (98.7%, *n*=939) owned a mobile phone (see Table 3). Proportionally, allied health staff least identified as owning a mobile phone (97.8%, *n*=228).

The majority of respondents (98.4%, *n*=903) reported camera functionality on their mobile phone. Overall, the majority of respondent's mobile phones (90.7%, *n*=838) were connected to the Internet. Medical staff were most connected (94.7%, *n*=162) and nursing staff were least connected (89.6%, *n*=475). A similar pattern was seen amongst nursing, medical and allied health respondents in reference to password/PIN protection on their mobile phones (See Table 3). Overall, just over three quarters of survey participant's phones were password/PIN protected (76.3%, 705).

Table 3: The characteristics of survey respondent's mobile phones.

		Nursing	Medical	Allied Health	Total
Total completed surveys		**544**	**174**	**233**	**951**
Q7. Do you own a mobile phone? *n* (% of responses)	**Yes**	539 (99.1)	172 (98.8)	228(97.8)	**939 (98.7)**
	No	5 (0.9)	2 (1.1)	5 (2.1)	**12 (1.3)**
Total respondents		544	174	233	**951**
Q8. Does your phone have a camera function? *n* (% of responses)	**Yes**	524 (98.5)	162 (100.0)	219 (97.8)	**905 (98.6)**
	No	8 (1.5)	0 (0.0)	5 (2.2)	**13 (1.4)**
Total respondents		532	162	224	**918**
Q9. Is your mobile phone connected to the Internet? *n* (% of responses)	**Yes**	475 (89.6)	162 (94.7)	201 (90.1)	**838 (90.7)**
	No	55 (10.4)	9 (5.3)	22 (9.9)	**86 (9.3)**
Total respondents		530	171	223	**924**
Q10. Is your mobile phone password/PIN protected? *n* (% of responses)	**Yes**	385 (72.6)	141 (82.5)	179 (80.3)	**705 (76.3)**
	No	145 (27.4)	30 (17.5)	44 (19.7)	**219 (23.7)**
Total respondents		530	171	223	**924**

4.4.2 Hospital-owned cameras

Results showed that 28.1% (*n*=260) of respondents had been provided with a camera by the DHB to take photographs. Less than 5% of respondents use it for all image capture (table 4) and 10.4% (*n*=96) never use the camera they were provided with. Proportionally, more allied health staff have been provided with camera compared with medical or nursing respondents and results showed that they also use the cameras they have been provided with most often (table 4).

Table 4: DHB-owned camera possession and usage.

		Nursing	Medical	Allied Health	Total
Total completed surveys		**544**	**174**	**233**	**951**
Q11. Has your DHB ever provided you with a camera with which to take photographs? *n* (% of responses)	Yes and I use it for all images	22 (4.1)	6 (3.5)	17 (7.6)	**45 (4.9)**
	Yes and I use it sometimes	68 (12.8)	16 (9.4)	35 (15.7)	**119 (12.9)**
	Yes but I don't use it	57 (10.7)	6 (3.5)	33 (14.8)	**96 (10.4)**
	No	383 (72.3)	143 (83.6)	138 (61.9)	**664(71.9)**
Total respondents		**530**	**171**	**223**	**924**

4.4.3 Mobile phones as photographic tools in the clinical setting

A third of respondents (33.1%, *n*=306) have taken photographs of patients, body parts/organs or medical notes using a mobile phone at a DHB hospital site for either personal or professional use (see Table 5).

4.4.3.1 Nursing respondents

A quarter of nursing staff who answered the question acknowledged having taken photographs of patients, body parts/organs or medical notes using mobile phones in the clinical setting (25.7%, *n*=136). The highest proportion of responses in this category came from nurses working in the clinical areas of mental health and surgery (*n*=98 in both groups) out of which 12.2% (*n*=12) and 35.7% (*n*=35) of staff members respectively stated that they had used mobile phones to take photographs. Half of paediatric/child health/youth health nursing respondents (53.3%, *n*=8) and neonatal respondents (50.0%, *n*=5) stated that they had taken photographs using mobile phones in the course of their employment at the DHB.

4.4.3.2 Medical respondents

Nearly two-thirds of medical respondents (62.9%, *n*=107) had taken photographs of patients, body parts/organs or medical notes using a mobile phone at a DHB hospital site (see Figure 4). The highest proportions of 'Yes' responses came from surgical specialties (*n*=19), general medicine (*n*=18), emergency medicine (n=11) and paediatrics/child health/youth health (*n*=11).

4.4.3.3 Allied health respondents

Just over a quarter (27.6%, *n*=56) of allied health staff confirmed that they had used mobile phones to photograph patients, body parts/organs or clinical notes at their DHB. Highest representation of responses came from occupational therapy of which 34.6% (*n*=18)

affirmed that they have performed the practice. Half of physiotherapy respondents (51.1%, *n*=22) and 16.7% (*n*=7) of social work respondents also acknowledged that they had.

Table 5: Use of mobile phones for taking photographs of patients, body parts/organs or medical notes at any DHB hospital site.

	Answer Choices	Nursing	Medical	Allied Health	Total
Total completed surveys		**544**	**174**	**233**	**951**
Q12. Have you ever taken photographs of patients, body parts/organs or medical notes using a mobile phone at any DHB hospital site? (for either personal or professional use) *n* (% of responses)	Yes	136 (25.7)	107 (62.9)	63 (28.2)	**306 (33.1)**
	No	394 (74.3)	63 (37.1)	160 (71.7)	**617 (66.8)**
Total respondents		**530**	**170**	**223**	**923**

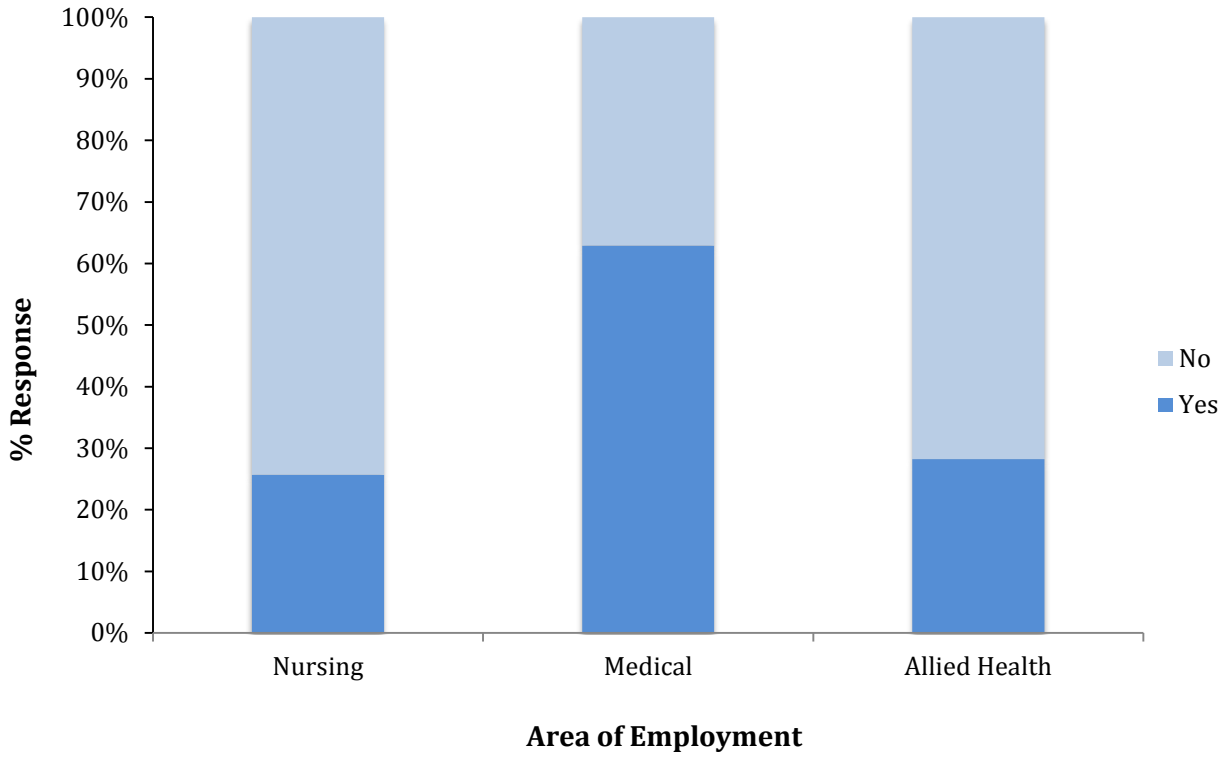


Figure 4: Responses by discipline regarding use of mobile phones to take photographs of patients, body parts/organs or medical notes at any DHB hospital site.

4.4.4 Consent and storage

Respondents were asked whether they gathered 'verbal', 'written', 'third-party' or no consent from patients when using their mobile phone as a photographic tool. They were also given the option of selecting more than one answer. The most common form of consent sought by health professional was verbal (85.9%, *n*=263). Written consent was routinely obtained by 28.4% (*n*=87) of respondents whilst 10.8% (*n*=33) did not seek consent (in any form).

Respondents were asked if they recorded that they took images of patients, body parts/organs or medical notes in the patient record and data were collected using a Likert scale (always; sometimes; rarely; never). Results displayed in Table 6 showed that a quarter of respondents (25.5%, *n*=78) never recorded their actions; 15.3% (*n*=47) acknowledged that they rarely recorded; a quarter of respondents (26.1%, *n*=80) sometimes recorded; and 33.0% (*n*=101) always recoded the taking of patient images in clinical notes.

Almost three quarters of respondents who confirmed that they had taking photographs on their mobile phones reported that they deleted all images taken by them (71.9%, *n*=220). Retention of images of an interesting or unusual nature to respondents was selected by 18.6% (*n*=57) and 9.5% (*n*=29) kept all images that they took themselves (refer to Table 6). Medical staff most commonly kept photos of patients/clinical notes that they had taken on their mobile phones more often then their nursing or allied health colleagues (45.0%, *n*=45; 16.1%, *n*=22; 29.7, *n*=19).

Respondents were asked 'Of those photographs that have been TAKEN and kept by you, how are they stored?' The most common response was that the images were stored

locally on their mobile phone (45.7%, *n*=106) or on another separate device (37.4%, n=83). Refer to Table 6 for more detailed information.

There were a small proportion of respondents that stored the photographs they had taken on both on a mobile phone and another storage device (5.4%, *n*=12). Storage of photographs solely on an Internet 'Cloud' storage site, website or social networking site was stated in 3.4% (*n*=8) of question respondents and 10.4% (*n*=23) stored them on multiple devices both locally and externally.

Respondents were asked whether the photos they took on their mobile phones were identifiable. Answer options were 'Yes', 'No' or 'Some of them'. More than three quarters of nursing and medical staff stated that their images were not identifiable (Table 6). Less than half of allied health respondents could confirmed that their images were not identifiable (42.8%, *n*=27).

Table 6: The consent and storage process

	Answer Choices	Nursing	Medical	Allied Health	Total
Total Completed Surveys		**544**	**174**	**233**	**951**
Q13. What consent do you gather from patients? (You may select more than one option) *n* (% of responses)	Verbal	112 (82.3)	96 (89.7)	55 (87.3)	**263 (85.9)**
	Written	36 (26.5)	28 (26.2)	23 (36.5)	**87 (28.4)**
	Third-party	9 (6.6)	3 (2.8)	2 (3.2)	**14 (4.6)**
	None	18 (13.2)	10 (9.3)	5 (7.9)	**33 (10.8)**
Total respondents		**136**	**107**	**63**	**306**
Q14. Do you record that you took images of patients, body parts/organs or medical notes in the patient record? *n* (% of responses)	Always	51 (37.5)	18 (16.8)	32 (50.8)	**101 (33.0)**
	Sometime	25 (18.4)	41 (38.3)	14 (22.2)	**80 (26.1)**
	Rarely	17 (12.5)	26 (24.3)	4 (6.3)	**47 (15.3)**
	Never	43 (31.6)	22 (20.6)	13 (20.6)	**78 (25.5)**
Total respondents		**136**	**107**	**63**	**306**
Q15. Do you delete photographs of patients, body parts/organs or medical notes that have been taken by you? *n* (% of responses)	Yes, I delete all images taken by me	114(83.8)	62 (57.9)	44 (69.8)	**220 (71.9)**
	No, I keep all images taken by me	10 (7.3)	9 (8.4)	10 (15.9)	**29 (9.5)**
	No, I retain all images the I find interesting or unusual	12 (8.8)	36 (33.6)	9 (14.3)	**57 (18.6)**
Total respondents		**136**	**107**	**63**	**306**
Q16. Of those photographs that have been TAKEN and kept by you, how are they stored? *n* (% of responses)	Locally, on my mobile phone	45 (46.9)	52 (59.1)	9 (18.7)	**106 (45.7)**
	Locally, on another storage device	39 (40.6)	18 (20.4)	26 (54.2)	**83 (37.4)**
	Locally, on my mobile phone and another storage device	0 (0.0)	9 (10.2)	3 (6.2)	**12 (5.4)**
	Externally, saved to an internet 'Cloud' storage site, website or social networking site	3 (3.1)	2 (2.3)	3 (6.2)	**8 (3.6)**
	Both locally and externally	9 (9.4)	7 (7.9)	7 (14.6)	**23 (10.4)**
Total respondents		**96**	**88**	**48**	**222**
Q17. Were these images identifiable? (i.e. including a name, NHI, identifying features, tattoos, distinct skin markings) *n* (% of responses)	Yes	17 (12.5)	6 (5.6)	14 (22.2)	**37 (12.1)**
	No	107 (78.7)	82 (76.6)	27 (42.8)	**216 (70.6)**
	Some of them	12 (8.8)	19 (17.8)	22 (34.9)	**53 (17.3)**

Total respondents	**136**	**107**	**63**	**306**

4.4.5 Image sharing

Results showed that health professionals were more likely to share non-identifiable images than identifiable images (for example: photographs including a name, NHI, identifying features such as facial features, tattoos or distinctive skin markings) using a mobile phone (see Table 7 and Table 8). Regardless of whether or not they had personally taken the images, less than 15% of respondents (14.5%, *n*=138) stated that photographs they had shared with other health professionals were identifiable. Nurses had shared identifiable images the least (9.6%, *n*=52) compared with medical and allied health staff of whom just over a fifth admitted to having shared identifiable images (see Table 7). Those that responded affirmatively to Question 18, were then directed to answering Questions 19, 20 and 21.

Results in Table 7 showed that the most common method of sharing identifiable images was by physically showing others (86.5%, *n*=244). Email was the next most common method of sharing identifiable images with over half of those who acknowledged that they had shared images admitting to using this method 50.7% (*n*=70). Of those that have shared identifiable images, this transaction was always recorded in the patient's medical record by 22.4% (n=64) of respondents and a quarter (37.4%, *n*=52) stated that they rarely or never recorded these transactions. Nursing staff recorded the sharing of identifiable images with other health professionals most frequently with over half (57.7%, *n*=30) stating that they had always done so compared with lower statistics from their medical and allied health colleagues.

The majority of respondents that confirmed having taken identifiable photographs of patients or patient information in the clinical setting felt that doing so had a positive affect on

the care of patient's involved (90.0%, *n*=125). No respondents thought that sharing of identifiable images had negatively impacted on their patients (Table 7).

Results showing respondents' sharing of non-identifiable images with other health professionals was higher across all sample groups compared with the sharing of identifiable images. As displayed in Table 8, medical staff most commonly shared non-identifiable images with over half reporting that they had done so (56.3%, *n*=98). As with identifiable images, 'physically showing' and 'Email' were the most popular options for sharing non-identifiable images.

Respondents that answered 'Yes' to the Question 22 regarding whether they had shared non-identifiable images with another health professional were subsequently asked how frequently they recorded the sharing of non-identifiable images with their colleagues in the patient's medical record. Just over a fifth of respondents (22.4%, *n*=64) stated that they always consistently did and just over half of respondents (53.3%, *n*=152) never or rarely recorded these transactions.

The majority of respondents felt that the sharing of non-identifiable images positively affected the care of their patients (74.0%, *n*=211) and again no one thought it had negatively impacted on their patients.

Table 7: Practice and attitudes towards the sharing of identifiable patient images.

	Answer Choices	Nursing	Medical	Allied Health	Total
Total Completed Surveys		**544**	**174**	**233**	**951**
Q18. Have you ever shared IDENTIFIABLE images with another health professional? (i.e. images that include a patient's name, NHI or identifying features such as facial features, tattoos, or distinct skin markings) *n* (% of responses)	Yes	52 (9.6)	39 (22.4)	47 (20.2)	**138 (14.5)**
	No	491 (90.4)	135 (77.6)	186 (79.8)	**813 (85.7)**
Total respondents		**543**	**174**	**233**	**950**
Q19. What method did you use? (You may select more than one option) *n* (% of responses)	Physically showed them	42 (80.8)	31 (79.5)	39 (83.0)	**112 (81.1)**
	Multimedia Messaging (phone to phone)	3 (5.7)	14 (35.9)	1 (2.1)	**18 (13.0)**
	Email	24 (46.1)	21 (53.8)	25 (53.2)	**70 (50.7)**
	Via a social networking website	0 (0.0)	0 (0.0)	0 (0.0)	**0 (0.0)**
	Other	6 (11.5)	5 (12.8)	5 (10.6)	**23 (16.7)**
Total respondents		**52**	**39**	**47**	**138**
Q20. Were these transactions recorded in the patient record? *n* (% of responses)	Always	30 (57.7)	7 (17.5)	17 (36.2)	**54 (39.1)**
	Sometimes	8 (15.4)	9 (22.5)	16 (34.0)	**33 (23.9)**
	Rarely	4 (7.7)	8 (20.0)	5 (10.6)	**17 (12.3)**
	Never	10 (19.2)	15 (38.5)	9 (19.1)	**34 (24.6)**
Total respondents		**52**	**39**	**47**	**138**
Q21. How do you think these transactions affected the care of patients involved? *n* (% of responses)	Positively	46 (88.5)	35 (87.5)	44 (93.6)	**125 (90.6)**
	Negatively	0 (0.0)	0 (0.0)	0 (0.0)	**0 (0.0)**
	Both	1 (1.9)	0 (0.0)	1 (2.1)	**2 (1.4)**
	Neutral	4 (7.7)	3 (7.5)	2 (4.3)	**9 (6.5)**
	Unsure	1 (1.9)	1 (2.6)	0 (0.0)	**2 (1.4)**
Total respondents		**52**	**39**	**47**	**138**

Table 8: Practice and attitudes towards the sharing of non-identifiable patient images.

	Answer Choices	Nursing	Medical	Allied Health	Total
Total Completed Surveys		**544**	**174**	**233**	**951**
Q22. Have you ever shared NON-IDENTIFIABLE images with another health professional? (i.e. images that include a patient's name, NHI or identifying features such as facial features, tattoos, or distinct skin markings) *n* (% of responses)	Yes	124 (22.8)	98 (56.3)	63 (27.0)	**285 (30.0)**
	No	419 (77.2)	76 (43.7)	170 (73.0)	**665 (70.0)**
Total respondents		**543**	**174**	**233**	**950**
Q23. What method did you use? (You may select more than one option) *n* (% of responses)	Physically showed them	110 (88.7)	83 (84.7)	51 (80.9)	**244 (86.5)**
	Multimedia Messaging (phone to phone)	11 (8.9)	26 (26.5)	8 (12.7)	**45 (15.9)**
	Email	38 (30.6)	44 (44.9)	28 (44.4)	**110 (39.0)**
	Via a social networking website	0 (0.0)	0 (0.0)	0 (0.0)	**0 (0.0)**
	Other	13 (10.5)	7 (7.1)	10 (15.9)	**16 (5.7)**
Total respondents		**124**	**98**	**63**	**285**
Q24. Were these transactions recorded in the patient record? *n* (% of responses)	Always	40 (32.3)	13 (13.3)	11 (17.5)	**64 (22.4)**
	Sometimes	20 (16.1)	23(23.5)	26 (41.3)	**69 (24.2)**
	Rarely	15 (12.1)	27 (27.5)	7 (11.1)	**49 (17.2)**
	Never	49 (39.5)	35 (35.7)	19 (30.2)	**103 (36.1)**
Total respondents		**124**	**98**	**63**	**285**
Q25. How do you think these transactions affected the care of patients involved? *n* (% of responses)	Positively	80 (64.5)	85 (86.7)	46 (73.0)	**211 (74.0)**
	Negatively	0 (0.0)	0 (0.0)	0 (0.0)	**0 (0.0)**
	Both	3 (2.4)	0 (0.0)	1 (1.6)	**4 (14.0)**
	Neutral	36 (29.0)	12 (12.2)	14 (22.2)	**62 (21.7)**
	Unsure	5 (4.0)	1 (1.0)	2 (3.2)	**8 (2.8)**
Total respondents		**124 (43.5)**	**98 (34.4)**	**63 (22.1)**	**285**

Respondents were asked whether another health professional from their DHB or another DHB had ever shared photographs of patients, body parts/organs or clinical notes with them (Table 9). Answer options were ‘Yes’ or ‘No’. If they responded ‘Yes’ they were then directed to complete further questions about this practice. Results showed that some health professionals are receiving images from colleagues at their home DHB as well as other DHBs. Medical respondents most commonly reported having received images from colleagues 62.8% reported that they had received images. Fewer nursing and allied health staff had received images from colleagues (37.4, *n*=203 and 35.4%, *n*=82 respectively).

Physically showing images to colleagues followed by email was again the most common form of sharing (see Table 9).

Respondents that had received images from colleagues were asked whether they were located within one of their DHB's hospital sites or elsewhere at the times they received these images. Answer options were ‘On-site’, ‘Off-site’ or ‘Both’. The majority of respondents reported to have been onsite when they received images from other colleagues (84.3%, *n*=339). Nursing and allied health respondents were most commonly onsite at these times (refer to Table 9) where as nearly a quarter of medical respondents (24.8%, *n*=29) stated that they had been both on-site and on-site at the times that they had received photographs of patients or patient information.

Less than a fifth of respondents who had received photographs of patients or patient information from other heath professionals (18.9%, *n*=76) could confirm that the sharing of these images had been recorded in the patient’s medical record and more than half in all three sample groups were unsure (Table 9).

Respondents were asked whether they deleted images that had been shared with them by other health professionals. The majority of health professionals (84.6%, *n*=283) deleted

all images sent to them or stated that they had never stored photographs of patients, body parts/organs or clinical notes that have been sent to them by others. Nursing staff retained photographs the least compared with medical or allied health respondents with 9.9% (*n*=20) reporting that they kept all images or only kept the ones that were interesting or unusual to them.

Respondents were asked how they stored images that had been shared with them by other health professionals. Whilst the majority (70.9%, *n*=285) stated that they had never stored any images of patients or patient information that had been sent to them, the most common form of storage was on a storage device other than the mobile phone (15.0%, *n*=64) or on the mobile phone itself (8.5%, *n*=34). Medical respondents most frequently recorded that they stored images on these devices and 1% (*n*=4) of total respondents for the question reported to have saved images that had been sent to them on a 'Cloud' storage device, website or social networking site.

Just over half of respondents (56.2%, *n*=226) felt that the sharing of images that they had received from other health professionals had positively affected the care of patients involved (Table 9).

Table 9: Sharing, storage and attitudes towards patient images that have been shared with respondents.

	Answer Choices	Nursing	Medical	Allied Health	Total
Total Completed Surveys		**544**	**174**	**233**	**951**
Q26. Has ANOTHER health professional from your DHB or another DHB ever shared photographs of patients, body parts/organs or clinical notes with you? *n* (% of responses)	Yes	203 (37.4)	118 (62.8)	82 (35.2)	**403 (42.4)**
	No	340 (62.6)	56 (32.2)	151 (64.8)	**547 (57.6)**
Total respondents		**543**	**174**	**233**	**950**
Q27. What method did they use? (You may select more than one answer) *n* (% of responses)	Physically showed you	183 (90.1)	97 (82.9)	69 (84.1)	**349 (86.8)**
	Multimedia Messaging (phone to phone)	7 (3.4)	30 (25.6)	4 (4.9)	**41 (10.2)**
	Email	33 (16.2)	39 (33.3)	35 (42.7)	**107 (26.6)**
	Via a social networking site	2 (1.0)	2 (1.7)	0 (0.0)	**4 (1.0)**
	Other	4 (2.0)	6 (5.1)	5 (6.1)	**15 (3.7)**
Total respondents		**203**	**117**	**82**	**402**
Q28. Were you located within one of your DHB's hospital sites or elsewhere at the times you received these images? *n* (% of responses)	On-site	188 (92.6)	82 (70.1)	69 (84.1)	**339 (84.3)**
	Off-site	8 (3.9)	6 (5.1)	0 (0.0)	**14 (3.5)**
	Both	7 (3.5)	29 (24.8)	13 (15.8)	**49 (12.2)**
Total respondents		**203**	**117**	**82**	**402**
Q29. Were these transactions recorded in the patient's medical record? *n* (% of responses)	Yes	43 (21.2)	8 (6.8)	25 (30.5)	**76 (18.9)**
	No	61 (30.0)	46 (39.3)	14 (17.1)	**121 (30.1)**
	Unsure	99 (48.8)	63 (53.8)	43 (52.4)	**205 (51.0)**
Total respondents		**203**	**117**	**82**	**402**
Q30. Do you delete images that others have shared with you? *n* (% of responses)	Yes – I delete all images sent to me	46 (22.7)	53 (45.3)	34 (41.5)	**133 (33.1)**
	No – I keep all images	4 (2.0)	9 (7.7)	7 (8.5)	**20 (5.0)**
	No – I retain images that I find interesting or unusual but delete all others	16 (7.9)	19 (16.2)	7 (8.5)	**42 (10.5)**
	I have never stored photographs of patients, body parts or clinical notes	137 (67.5)	36 (30.8)	34 (41.5)	**207 (51.5)**
Total respondents		**203**	**117**	**82**	**402**

Q31. Of those shared images that have been kept by you, how are they stored? *n* (% of responses)	Locally – on my mobile phone	11 (5.4)	20 (17.1)	3 (3.7)	**34 (8.5)**
	Locally – on another storage device	21 (10.3)	18 (15.4)	25 (30.5)	**64 (15.9)**
	Locally – both on my mobile phone and another storage device	0 (0.0)	6 (5.1)	2 (2.4)	**8 (2.0)**
	Externally – saved to an internet 'Cloud' storage site, website or social networking site	2 (1.0)	0 (0.0)	2 (2.4)	**4 (1.0)**
	Both locally and externally	1 (0.5)	4 (3.4)	2 (2.4)	**7 (1.7)**
	I have never stored photographs of patients, body parts or clinical notes	168 (82.8)	69 (59.0)	48 (58.5)	**285 (70.9)**
Total respondents		**203**	**117**	**82**	**401**
Q32. How do you think these transactions affected the care of patients involved? *n* (% of responses)	Positively	95 (46.8)	79 (67.5)	52 (63.4)	**226 (56.2)**
	Negatively	5 (2.5)	1 (0.8)	1 (1.2)	**7 (1.7)**
	Both	8 (3.9)	4 (3.4)	4 (4.9)	**16 (4.0)**
	Neutral	71 (35.0)	25 (21.4)	18 (21.9)	**114 (28.4)**
	Unsure	24 (11.8)	8 (6.8)	7 (8.5)	**39 (9.7)**
Total respondents		**203**	**117**	**82**	**402**

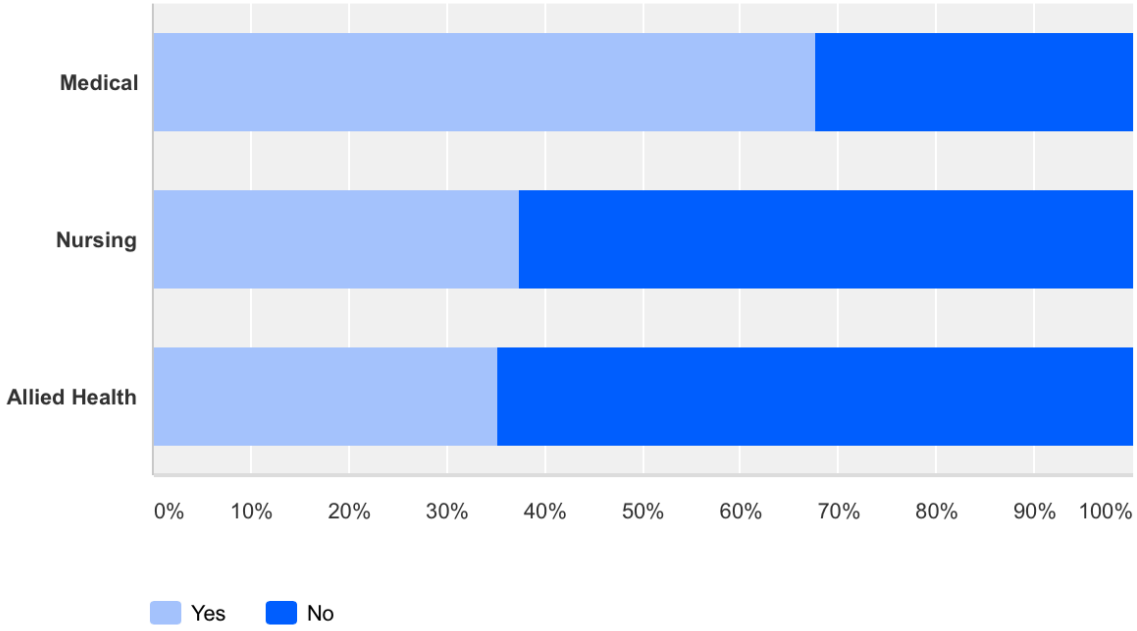


Figure 5: Responses by discipline received for Question 26 - Has ANOTHER health professional from your DHB or another DHB ever shared photographs of patients, body parts/organs or clinical notes with you?

4.4.6 Reasons for using mobile phones to take photographs in clinical settings.

Survey participants were asked to state their reasons for taking photos of patients, body parts/organs or clinical notes using their mobile phones and were given the option of selecting more than one answer from a list of options, which included those displayed in Figure 6. As was reflected in Question 11, almost two-thirds of total respondents stated that they did not take photographs of patients or clinical notes on their mobile phones. Of those that did, the most popular reason for using mobile phones to take photographs amongst health professionals was for input from another health professional (26.5%, *n*=252). Education/training was also a popular choice for 17.3% (*n*=164) of respondents. Medical respondents most often reported taking photographs of patients or clinical notes for all of the options listed. Options included: for input from another health professional; for education/training; for presentation; because it is interesting or unusual; to show someone outside the hospital; I do not take photographs of patients, the body parts/organs or clinical notes on my mobile phone; other. 'Other' reasons provided by participants were recoded to form the following categories: photographs for use in funding applications; photographs to demonstrate faults or issues with equipment being used in patient treatment; photographs for use in presentations being made to other health service providers.

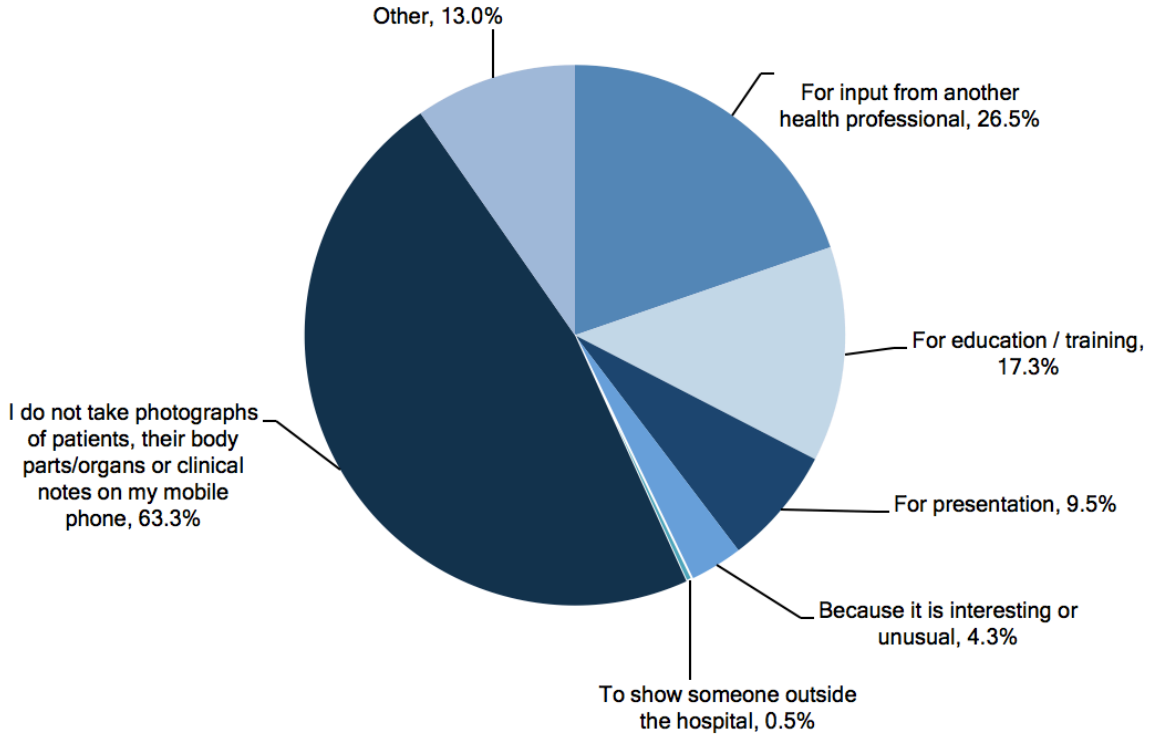


Figure 6: Reasons for taking photographs of patients, their body parts/organs or clinical notes using a mobile phone.

Table 10: Reasons for taking photographs of patients, their body parts/organs or clinical notes on mobile phones.

	Nursing	Medical	Allied Health	Total
Total Completed Surveys	**544**	**174**	**233**	**951**
Q33. "The reason I take photographs of patients, their body parts/organs or clinical notes on my mobile phone is..." (you may select more than one answer) *n* (% of responses)				
For input from another health professional	103 (19.0)	94 (54.3)	55 (23.6)	**252 (26.5)**
For education/training	67 (12.3)	64 (37.0)	33 (14.2)	**164 (17.3)**
For presentation	28 (5.2)	44 (25.4)	18 (7.7)	**90 (9.5)**
Because it is interesting or unusual	12 (2.2)	22 (12.7)	7 (3.0)	**41 (4.3)**
To show someone outside the hospital	1 (0.2)	3 (1.7)	1 (0.4)	**5 (0.5)**
I do not take photographs of patients, the body parts/organs or clinical notes on my mobile phone	388 (71.4)	62 (35.8)	151 (64.8)	**601 (63.3)**
Other	55 (10.1)	24 (13.9)	44 (18.9)	**123 (13.0)**
Total respondents				**949**

4.4.7 Sharing with online networks

Respondents were asked whether they had ever uploaded a photograph of a patient, their body parts/organs or clinical notes to any website, social networking website or mobile app? Examples of such online networks were provided which included but was not limited to the following: Twitter; Facebook; Figure 1; Flickr; Instagram. Data from Table 11 showed that a very small proportion of health professionals (0.4%, *n*=4) stated that they had done so.

Table 11: Distribution of photographs of patients, their body parts/organs or clinical notes to websites, social networking websites or mobile apps.

	Answer Choices	**Nursing**	**Medical**	**Allied Health**	**Total**
Total Completed Surveys		**544**	**174**	**233**	**951**
Q34. Have you ever uploaded a photograph of a patient, their body parts/organs or clinical notes to any website, social networking website or mobile app? (e.g. Twitter, Facebook, Flickr, Instagram, Figure 1) *n* (% of responses)					
	Yes	1 (0.2)	3 (1.7)	0 (0.0)	**4 (0.4)**
		1 (0.2)			
	No	542 (99.8)	170 (98.3)	233 (100.0)	**945 (99.6)**
Total respondents		**543 (57.2)**	**173 (18.2)**	**233 (24.5)**	**949**

4.5 Research aim 2: To explore the perceptions and attitudes of health professionals in regard to local policy.

All respondents were asked whether they knew if their DHB had a policy regarding photographic recording. Respondents were able to select one answer from the options on Table 12. Out of respondents who answered the question, more than three-quarters of staff had either not read the policy or were not aware that one existed. Less than a quarter of respondents (23.7%, *n*=225) reported that that they were aware of the policy and had read it.

Following this, these same respondents (*n*=225) were then asked who they thought owned any photographs taken using a mobile phone whilst on their DHB site and the survey was structured so that participants had the option of selecting more then one answer (refer to Table 12). The most popular answer was that 'the patient' owned the photographs (65.2%, *n*=619).

Table 12: Health professional's attitudes and awareness of photographic policy at their DHB.

	Nursing	**Medical**	**Allied Health**	**Total**
Total Complete Surveys	**544**	**174**	**233**	**951**
Q35. Do you know if your DHB has a policy regarding photographic recording?				
Yes - I have read one	132 (24.3)	36 (20.8)	57 (24.5)	**225 (23.7)**
Yes – but I have never read it	200 (36.8)	70 (40.5)	82 (35.2)	**352 (37.1)**
No – I am not aware of one	211 (38.9)	67 (38.7)	94 (40.3)	**372 (39.2)**
n (% of responses)				
Total respondents	**543 (57.2)**	**173 (18.2)**	**233 (24.5)**	**949**
Q36. Who do you believe owns any photographs taken using a mobile phone whilst on your DHB site? (you may select more than one answer)				
The patient	354 (65.2)	99 (57.2)	166 (71.2)	**619 (65.2)**
Those who take the photos	121 (22.3)	60 (34.7)	42 (18.0)	**223 (23.5)**
The DHB	208 (38.3)	51 (29.5)	109 (46.8)	**368 (38.8)**
Those who receive the photos	21 (3.9)	2 (1.2)	6 (2.6)	**29 (3.0)**
Nobody owns them	58 (10.7)	25 (14.4)	18 (7.7)	**101 (10.6)**
n (% of responses)				
Total respondents	**543**	**173**	**233**	**949**

Additional analysis of the results of these last two questions was performed to compare 'Yes – I have read the policy' responses from Question 35 and answer options from Question 36 (*n*=225). Results showed that the majority of people who had read the photographic recording policy thought that the patient owned the photographs (69.8%, *n*=157). Less than half of respondents thought that the DHB owned the photographs (42.7%, *n*=96), a fifth of respondents thought that the person who took the photos owned them (19.6%, *n*=44), 5.3% (*n*=12) respondents thought that nobody owned them and 2.2% (*n*=5) thought that it was whoever received the photographs that owned them (Figure 7).

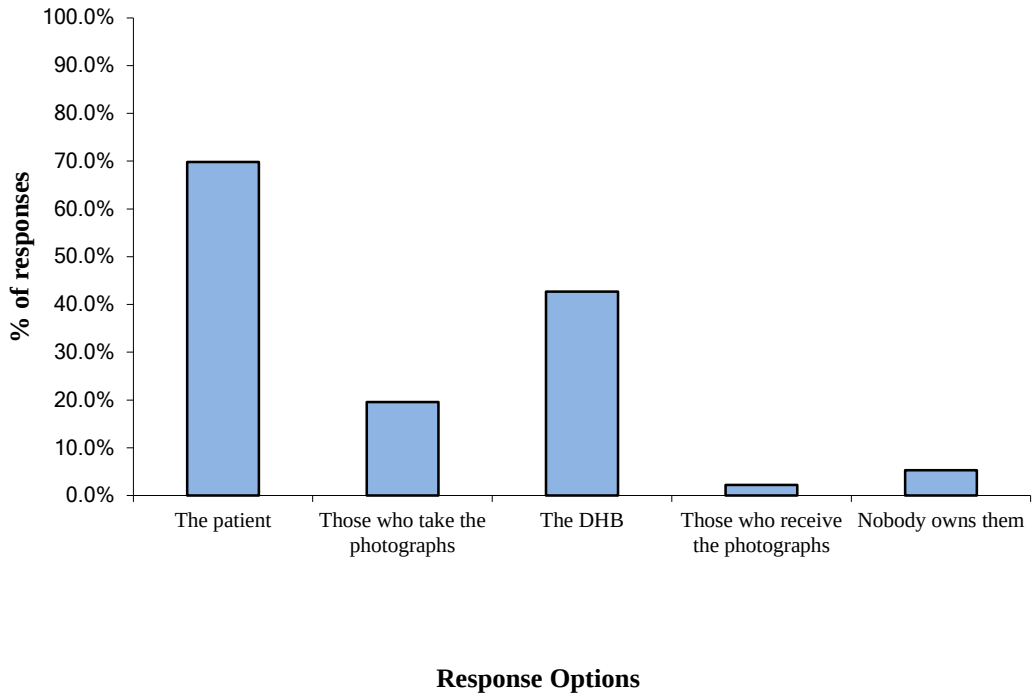


Figure 7: Respondents beliefs about photographic recording ownership.

4.6 Chapter summary

The following is an outline of key findings. The online survey produced a response rate of 25.2% (*n*=951). 22.3% (*n*=) of nurses, 28% (*n*=) of medical staff and 33% (*n*=) of allied health staff completed the questionnaire.

Almost all respondents owned a mobile phone with camera capability (98.6%, *n*=905), the majority of respondents had a mobile phones that was connected to the Internet (90.7% *n*=838) and approximately three-quarters of respondents (76.3%, *n*=705) had password/PIN protection on their devices.

Just over a quarter of respondents had been provided with a camera by their employer with which to take photographs but less than 5% used it for all photographs that they took.

A third of total respondents (33.1%, *n*=306) had taken photographs of patients, their body parts/organs or medical notes using a mobile phones at their DHB. Mobile phone photography of patients or patient information had been performed by over a quarter of nursing (25.7, *n*=136) and allied health (28.2%, *n*=63) respondents and nearly two-thirds of medical staff (62.9%, *n*=107).

Less than a third of responents (28.4%, *n*=87) obtained written consent from their patients, with verbal consent being the most common practice in 85.9% of respondents (*n*=263).

A third of respondents always recorded that they took images of patients, their body parts/organs or medical notes in the patient's record whereas 40.8% (*n*=125) rarely or never did.

Of the 28.1% (*n*=86) of respondents who did keep all or some of their photographs, the most common place to store those images was on the mobile phone itself (45.7%, *n*=106) or on another storage device (37.4%, *n*=83) and 29.4% (*n*=90) health professionals stated that all or some of the images on their mobile phones were identifiable.

Health professionals were more likely to share non-identifiable images than identifiable images. Regardless of whether they had taken the images themselves or not, 14.5% (*n*=138) noted that the images that had been shared with other health professionals were identifiable.

Physically showing another health professional was the most common form of sharing both identifiable and non-identifiable images (81.1%, *n*=112 and 86.5%, *n*=244 respectively) and half of respondents (50.7%, *n*=70) had used email to share identifiable images with another health professional.

Respondents that stated they always recorded the sharing of identifiable images in the patient's record comprised 39.1% (*n*=54) and 22.4% (*n*=64) always recorded the sharing of non-identifiable images. The majority of respondents thought that the sharing of images positively affected the care of patients involved.

Just under half of respondents (42.4%, *n*=403) had received images from health professionals from their DHB or from another DHB either via email (26.6%, *n*=107) or by being physically shown the images (86.8%, *n*=349). The majority of respondents were on their hospital site at the time when they received them (84.3%, *n*=339). Less than a fifth of respondents (18.9%, *n*=76) were able to confirm that these transactions had been recorded in the patient's medical record. All or some of the images shared with respondents were kept by 15.5% (*n*=62) and the most common storage location was on a local storage device other than their mobile phone (15.9%, *n*=64). Just over half (56.2%, *n*=226) thought that these sharing transactions had positively affected the care of patients involved.

Two thirds of respondents (63.3%, *n*=601) stated that they did not take photographs of patients, their body parts/organs or clinical notes on their mobile phone; a quarter reported that they did so to gain input from another health professional; 17.3% (*n*=164) did so for education/training purposes; presentation purposes were stated for 9.5% (*n*=90); 4.3%

(*n*=41) took photos because it was interesting or unusual; and five people took photos to show someone outside of the hospital.

There were 4 respondents out of 949 that reported to uploading a photograph of a patient, their body part/organs or clinical notes to a website, social networking website or mobile app.

The majority of respondents were either unaware that their DHB had a policy regarding photographic recording or were aware but had not read it (76.3%, *n*=724). Of those that had read the policy, two thirds of them (69.8%, *n*=157) thought that the patient owned the photographs.

In the next chapter, a discussion of the results has been formulated.

5 Discussion

5.1 Chapter introduction

The results will be discussed in this chapter in reference to the research aims. The first research aim was to survey the use of mobile phones by health professionals to photograph patients' body parts/organs or clinical confidential patient information in the clinical setting of a DHB. The second aim was to explore the perceptions and attitudes of health professionals in regard to their DHB's policy for photographic recordings. By answering these research aims, the study was designed to assess the risk to patient safety and confidentiality in the setting of a NZ DHB at a time of advancing mobile technology.

The ownership and characteristics of mobile phones owned by health professionals will be explored in the first part of this chapter. It will then continue with discussion about hospital-owned cameras, mobile phones as a clinical tool, consent, image storage, image sharing practices. Finally, in this section will be discussion of the reasons that mobile phones are used for taking photographs in the clinical setting.

Following this will be discussion about the perceptions and attitudes of health professionals in regard to local policy and the need to improve awareness and education of policy and best practice. Finally, the strengths and limitations of the study will be discussed and considerations for future research in will be presented.

5.2 Research aim 1: To survey to use of mobile phones by health professionals to photograph patients' body parts/organs or confidential patient information in the clinical setting of a DHB

5.2.1 Mobile phone ownership and characteristics

Almost all health professionals surveyed at the local DHB were in possession of a mobile phone (98.7%, *n*=939) with camera capabilities (98.6%, *n*=905) as of October 2016 with over 90% (*n*=838) also being connected to the Internet. Mobile phone ownership and camera functionality was consistent with other studies internationally that had previously surveyed hospital-based doctors, medical students and nurses (Kirk et al., 2014; Mobasheri, King, Johnston, Gautama, Purkayastha and Darzi, 2015). Both of these studies noted that over 98% (*n*=134 and *n*=281 respectively) of respondents owned mobile phones. However, figures for medical respondents with Internet connectivity were almost 6% higher compared to Kirk et al. (2014). This high uptake of mobile phones amongst health professionals may be due to their uses as primary communication devices by health professionals (Wu et al., 2010; Wu et al., 2011; Koehler et al., 2013) and their value as educational tools (Boyce, 2012).

Discussing in terms of age range, it seems that younger people were marginally more likely to own a mobile phone. Results showed that all respondents in the age ranges of <25, 25-34 and 35-44 except one, identified as owning a mobile phone. Comments received via email from allied health respondents during the course of the survey period revealed that some did not view their mobile phones as belonging to them because they had been provided by their employer. However, it cannot be stated with certainty whether this is the case for every respondent that identified as not owning a mobile phone.

5.2.2 Hospital-owned cameras

In this study, hospital-owned cameras were provided to and used by 28.1% of total respondents. Burns and Belton's (2013) figures for photographic capture in the hospital setting are strikingly different in comparison with both the collective results of this study (nursing, medical and allied health sample groups) and in comparison singularly with medical respondents. In the Burns and Belton study performed only two years earlier in 2013, 81.2% (n=65) of survey participants used hospital cameras, another 6 clinicians used personal cameras and 7 participants used their mobile phones for photographic imaging of patients. Burns and Belton (2013) noted that the action of clinicians taking their own photographs using either personal or hospital-owned devices in place of a Medical Photographer usually occurred when the photographer was unavailable or when time was a major factor. At the local DHB, just over a quarter of respondents (28.2%, n=260) have been supplied with a camera by their employer. However, possibly due to either reasons of convenience, ease of use or immediate accessibility, less than 5% (n=45) use it for all photographs in the clinical setting. It is unknown exactly why the hospital does not supply many cameras to its staff but it could be a cost-saving measure or funding providers are unaware of the need for them.

5.2.3 Mobile phones as photographic tools in the clinical setting

Photography of patients and confidential patient information is clearly taking place in the clinical setting of this DHB as evident in section 4.4.3, which shows that a third of respondents (33.1%, *n*=306) had used mobile phones to photographs patient's and patient information in this study. None-the-less, in such cases where health professionals are taking their own photographs on their own personal devices or on hospital-owned equipment, they still have an obligation to abide by their organisation's policy at such times when the Medical Photographer is unavailable. This includes obtaining written informed consent from any patient that may appear in the recording (Institute of Medical Illustrators, 2014b).

In comparison with Kirk et al. (2014), 65% of respondents in that study had taken medical images using a mobile phone. On initial observation, the proportion of total respondents who acknowledged having taken photographs of patients, their body parts/organs or medical notes was comparatively less (33.1%, *n*=306). However, when the medical respondents of this study are compared with the medical respondents surveyed by Kirk et al (2014), results are very similar (62.9%, *n*=107). Results of this study would suggest that nursing and allied health staff do not use mobile phones for taking photographs of patients, their body parts/organs or medical notes as often as their medical colleagues.

5.2.4 Consent

This study found that only just over a quarter of respondents (28.4%, *n*=87) routinely obtained consent in writing and 59.1% (*n*=181) always or sometimes recorded their actions in the patient's medical records. Similar finding were seen in Kirk et al. (2014) which showed that 78% (*n*=51) never recorded that they had taken photographs in patient notes.

It was also found in this study that verbal consent was by far the most common form of consent gathered by respondents as noted also in both Kirk et al. (2014) and Burns and Belton (2013). This is despite the fact that the local informed consent dictates prior written consent be obtained. Given that it is a requirement of the Patient Code of Rights for patients to be fully informed and that they have the right to give informed consent (Health and Disability Commissioner, 2009b), this result is of concern. However, on a more positive note, the results did indicate that the majority of respondents were at least aware of the necessity for obtaining consent with only 10.8% (*n*=33) reporting that they did not obtain consent in any form.

Just under three-quarters of respondents who took photos of patients or patient information on their mobile phones could confirm that their images were non-identifiable. Kirk et al. (2014) did investigate this but the data were not published. Allied health respondents were most likely to take identifiable photographs with 57.1% (*n*=36) acknowledging that either all or some of their photos were identifiable. However, justification for identifiable photos was presented by a number of allied health staff who commented that a proportion of their work involved analysing patient posture and gait as part of the treatment process. This required full-body photographs or videos to be taken and therefore they had found that making the patient non-identifiable was not feasible in these instances.

Some might argue that by removing identifying features, the images do not require consent for use outside of direct clinical care. The British Medical Journal's policy on image publication does not, in fact, require clinicians to provide written consent for images that they deem to be in no way identifiable from the images themselves or the articles affiliated with them (British Medical Journal, n.d.). The Institute of Medical Illustrators policy is unsupportive of this, stating "Written informed consent must be obtained from the patient for the intended use of the images" (Institute of Medical Illustrators, 2014a, p.4). Without explicit permission from the patient to upload their photographs to an unsecure or public arena, health professionals should not be doing so. This discord in the literature is perhaps reflective of the contemporary nature of this emerging topic.

5.3.5 Image storage

This study found that 28.1% (*n*=86) of respondents either kept all images taken by them or kept images that they found interesting or unusual. Of those that kept photographs the most common location to store images was on the mobile phone (45.7%, *n*=106). This was also the most popular option for respondents of the Kirk et al (2014) study reporting 65% (*n*=57) stating that they stored their images on the device itself. Burns and Belton (2013) have suggested that by retaining images on personal devices increases the risk of those images being used for purposes other than they were intended. If a clear consent process has not been followed and documented then the potential for misuse of the images is heightened.

Another question arises when considering what happens to images that have been deleted from mobile devices. Technological advancement has provided the ability to retrieve old data even after it has been erased from a computer memory. Therefore, if photographs have been deleted from a personal mobile device there is still potential that information could be retrieved by the right person with the technical knowledge to do so (Avast, 2014). This is an area that requires further consideration, particularly seeing as a large proportion of health professionals are using their phones to capture and store confidential medical information as revealed by this study (Tables 5 section 4.4.3 and Table 6 in section 4.4.4).

The Institute of Medical Illustrators (2014) does not advocate the use of mobile phones for clinical photography predominantly due to storage security issues and potential loss of image integrity on such devices. The Institute recognises that there are incidences where mobile phones are a useful for their photographic capabilities in extenuating circumstance such as during an emergency situation or in a remote location (Institute of Medical Illustrators, 2014b). However, it recommends exercising caution for occasions where health professionals request that the hospital's imaging department store images that have been captured on their personal digital devices (Institute of Medical Illustrators, 2014b).

5.2.6 Image sharing

Respondents in this study were more likely to share non-identifiable images (30%, *n*=285) with another health professional than identifiable images (14.5%, *n*=138). Further to this, the most popular method of sharing for both this study and the Kirk et al. (2014) study in the case of both non-identifiable and identifiable images was through physically showing colleagues on the device itself. Over 60% of respondents that confirmed having shared identifiable images had utilised non-secure methods of sharing such as email and multi-media messaging. In the case of both identifiable and non-identifiable images, no respondents shared images with other health professional via a social networking website. Similar engagement with non-secure sharing methods was found in the UK study by Mobasheri et al. (2015). The need for a secure method of sharing confidential patient information with colleagues was vocalised by a large proportion of doctors and nurses in that study. At the present time, the NZ National Health Information Technology Board is making efforts to make such secure information delivery systems accessible to health professionals on a national scale (Hospital Paediatrician, personal communication, September 29, 2015) and at the local level, implementation of the Wabalogic Medical Imaging Management System, imported from the UK, is already in progress (Medical Illustration Clinical Manager, personal communication, June 4, 2015). The results of this study only strengthen the need for a secure image-sharing system to be readily available to health professionals.

The majority of respondents felt that the sharing of both non-identifiable and identifiable images had a positive effect on the care of patients involved (74.0%, *n*=211 and 90.6%, *n*=125 respectively). This belief was seen also amongst medical respondents in Kirk et al. (2014). None of the respondents in this survey thought that the sharing of photographs had produced a negative effect on patient care. However, it is difficult to accurately measure this given that no other studies have published data on this.

Results of this study showed that 42.4% (*n*=403) of respondents have had images shared with them by other health professionals from the same DHB or from another DHB. Of those respondents that said 'Yes' to Question 26 (Appendix J), 86.8% (*n*=349) indicating that they had been physically shown photographs of patients, body parts/organs or clinical notes. Email was the next most popular method (26.6%, *n*=107). Unfortunately, there were four cases when health professionals had been shown confidential patient images via a social networking website. This was noted also in Kirk et al. (2014) where out of 134 responses, one person also admitted to this action.

No evidence could be sourced from other publications to show how common it was for health professionals to receive patient photographs via this method of communication. Such action is a clear violation of the patient Code of Rights (Health and Disability Commissioner, 2009b) and local DHB policy (Appendix A) and this is a serious admission from health professionals – one that warrants further investigation.

5.2.7 Reasons for using mobile phones to take photographs in clinical settings.

The UK-based study by Mobasheri et al. (2015) showed that 92.9% (*n*=252) of doctors and 53.2% (*n*=271) of nurses thought their mobile phones were 'very useful' or 'useful' to them in the course of their job in the clinical setting, particularly in enabling them to communicate. Photography is a form of visual communication that assists people to remember things as they were at a particular point in time (Van Dijck, 2008). In healthcare, the ability to photographically capture the progress of a condition, document injuries or unusual formations is a valuable tool for documentation in the patient's clinical record, patient/staff education and for publication/research (Burns and Belton, 2013). Respondents in this study and research from Australia and the UK has shown that mobile phones are being used for their photographic capabilities in a variety of situations (Burns and Belton, 2013; Kirk et al., 2014; Berle, 2008; Taylor et al., 2008). Reasons included but were not limited to enabling health professionals of all disciples to: gain input from another health professional; visually record patient progress; create treatment interventions; provide education/training of both fellow healthcare providers and patients/family, including in the form of presentations to other healthcare providers and The photographic capabilities of mobile phones are being embraced in a positive way by health professionals in order to assist and improve patient care. However going forward, policy needs to drive the administration and dissemination of these photographs so that the safety and confidentiality of patients undergoing hospital treatment is maintained.

5.3 Research aim 2: To explore the perceptions and attitudes of health professionals in regard to local policy

Health professionals that responded to the survey self-reported whether they were aware of and had read their DHB's policy on photographic recording. Less than a quarter (23.7%, *n*=225) of total respondents (*n*=949) stated that they had read the policy. Further analysis revealed that of those that had read the policy, less than half (*n*=96) understood that the DHB retained ownership of photographic recordings taken by healthcare staff in any of it's institutions (Appendix A). This lack of widespread understanding of local policy is not isolated to NZ institutions. Kirk et al. (2014) similarly noted that less than half of their respondents indicated accurate awareness of their hospital's image ownership policy. Like the results seen in Kirk et al. (2014), the majority of respondents in this study thought that the patient owned the images (65.2%, *n*=619).

5.4 The need to improve awareness and education

Patients have the right to access their private medical records and health professionals are advised to write in a manner bearing in mind that patients may read their notes at some point (Privacy Commissioner, 2008). With clinical photographs forming part of the patient's medical record, patients have rightful access to these as well.

If photographs are taken through official routes (for example by a Medical Photographer), a procedure of storage and linking to the patient's medical record is automatically initiated through established processes. However, health professionals now have the ability and the desire to take high-quality photographs on their own devices. Because of this addition to the skills of an increasingly greater number of technologically proficient health professionals, it is necessary for their employers and their governing bodies to make sure that health professionals of all disciples are aware and educated about their new

responsibility towards accurate maintenance of the patient's record and encourage them to embrace best practice.

5.5 Strengths of this study

Denscombe (2014) recommends that a good response rate should be compared with similar studies to judge the acceptability of its response rate. Although the 25.2% (*n*=951) total response rate of this study is lower compared with the study by Kirk et al. (2014), which had a 32% (*n*=134) response rate, the results do contribute to the health research body of knowledge on the topic. Given that there has been no NZ data on this until now, these results serve as a valuable starting point. Trends in mobile phone photography practices and attitudes for health professionals of three professional healthcare disciples are clearly visible in the data, which will enable policy-makers and stakeholders to begin to formulate a full risk assessment of the mobile phone as a photographic tool in the clinical setting of a NZ DHB.

5.6 Limitations of this study

A higher response rate would have added greater strength to the findings. The results here were obtained from a single DHB within NZ, which may limit their transferability to other DHBs and institutions national and internationally.

Other methods of engagement, such as paper-based questionnaires or one-on-one interviews were also considered. However, the monetary and time cost of other methods would have made it impossible, as they were beyond the scope of this dissertation.

Only quantitative data were collected in this survey. All participants were provided with the researcher's email address and some respondents did express comments and concerns about mobile phone photography practice through this avenue.

5.7 Recommended changes for future use of the survey

The survey is a replication of one previously administered in Australia (Kirk et al., 2014) and in an effort to make this research comparable to the original study, the researcher was limited in the changes that could be made. If this survey was to be repeated, the following recommendations have been made in terms of the survey design:

- Alteration to the wording of Question 7 "Do you own a mobile phone?" to "Do you use a mobile phone?". This would be followed by an addition question asking "Is it owned by you or provided to you by your employer?".

  Reason for change: Not all respondents viewed the mobile phone that they used as belonging to them. Therefore a small proportion of participants responded "No" to this question and were limited in the amount of information that they could provide the researcher in other areas of questioning.

- Include a question regarding whether respondents had ever been asked by a fellow health professional to take photographs for them.

  Reason for addition: Some health professionals emailed to let the researcher know that their experiences with mobile phone photography did not fit in with some of the options they were provided with. Some health professionals had been asked to take a photograph using another health professional's phone, because due to infection control measures the requester was unable to do so for themselves.

- Provide a box for feedback and comments at the end of the survey.

  Reason for addition: Because this is a sensitive topic, this would have enabled respondents to anonymously provide feedback or raise concerns, rather than emailing the researcher and identifying themselves.

- Provide clarification of local informed consent for photographic recording policy for all respondents at the end of the questionnaire after responses had been submitted.

Reason for addition: To provide respondents with clarification concerning photographic ownership and image management practices, rather than leave them questioning their practice. Because the current policy is not applicable to current technological practices, production of this information should be formulated in liaison with the relevant department of the health institution being researched.

5.8 Implications and recommendations

5.8.1 Regulating the use of mobile phones as a photographic tool in the clinical setting

The use of photography is not a new tool being used in the healthcare setting, but its ease of accessibility certainly is particularly as mobile phones with computer capabilities becomes more affordable to healthcare professionals (Horizon Research, 2014). The speed and convenience of mobile phones makes the practice of utilising these easily accessible devices extremely attractive to health professionals (Moberashi et al., 2015). Therefore, the need for producing an updated local policy and enforcement of compliance to said policy is more important to address than ever with more people routinely capturing and storing sensitive patient-related information on their personal devices.

There has been a noticeable increase in the use of personal mobile devices as a photographic tools for clinical purposes amongst health professionals and a lack of adherence to local policy and the Institute of Medical Illustrator's recommended Code of Professional Conduct (2014a) as evidenced by the results of this survey and surveys from overseas (Taylor, et al., 2008; Burns and Belton, 2013; Kirk et al., 2014). In order to provide adequate protection to patient safety and confidentiality, an applicable policy needs to be implemented for handling these images. With a proportion of health professionals choosing to utilise their personal devices for photographic purposes, the risk of images falling into the wrong hands given that they are routinely transported off the hospital campus is higher. If we could guarantee security and privacy then the use of mobile phones as routine photographic tools in the clinical setting would certainly benefit the patient greatly. The challenge is to ensure that the image is stored safely, transmitted securely and then either deleted or added to the patient's confidential medical record.

Since the use of mobile phones for photography in the clinical setting is more common than the use of a hospital-owned digital camera amongst health professionals at this

DHB (refer to section 4.4.2 and 4.4.3), healthcare organisations should be considering providing more of their health professionals with mobile phones. In that way, their use can be better regulated, also enabling devices to be destroyed after use by an individual. This may help in reducing some of the risk of private information being accidentally shared or falling into the wrong hands and being used for more sinister purposes.

Most studies on this issue have so far been focused solely on the medical profession Taylor et al., 2007; Burns and Belton, 2013; Kirk et al., 2014). To the knowledge of this researcher, this is the first study to address mobile phone photography practices amongst nursing and allied health staff. Therefore, further investigation of photography practices amongst nursing and allied health staff in other hospitals both in NZ and overseas would be useful to be able to make a direct comparison.

5.8.2 Management of identifiable images

It is evident from results in section 4.4.5 that it is not always possible for patients to remain non-identifiable in photographs taken for clinical purposes. With reference to feedback from some respondents, there needs to be consideration for local policy to allow for the ability to take identifiable full body images and recordings at times when there is a specific need to facilitate patient care. Professional governing bodies and employers can have a hand in stipulating the management process for images produced in such cases as part of a policy review.

5.8.3 Managing image storage

Where health professionals are taking photographs on personal devices and requesting storage of images to hospital servers, advice from the Institute of Medical Illustrators (2014b) is that the institution should produce a disclaiming document to state that they (the healthcare institution) “cannot be held responsible for image integrity, confidentiality, availability or security prior to upload’ (Institute of Medical Illustrators, 2014b). This is because at present

there is a lack of formal auditing processes in place to enable verification of image security and integrity if a dispute occurs or if a threat of liability is made concerning a patient's treatment (Institute of Medical Illustrators, 2014b). If mobile phones are to be officially authorised in NZ hospitals for use as photographic tools in the clinical setting, a written policy should contain specific reference to mobile phone photography best practice in conjunction with the medical photography profession.

To that end, there are now appropriate computer software programs and mobile phone apps that can provide security and privacy improvements. Encouragingly, the local DHB is in the process of implementing software to facilitate this (Medical Illustration Clinical Manager, personal communication, June 4, 2015) and discussions are taking place as to how this can be facilitated on a national scale as well (Hospital Paediatrician, personal communication, September 29, 2015).

5.8.4 Image ownership and consent

As discussed previously, photographs of patients or patient-related information forms part of the patient's clinical record and should thus treated with the same legal and ethical implications as other types of imagery such as x-ray or Magnetic Resonance Imaging (Berle, 2008). The subject of photographic ownership is one of legal copyright. Ordinarily, the person who takes the photograph is deemed the owner of that photograph (Copyright Council of New Zealand, 2007). However, in the field of healthcare the images being taken are of a personal and often explicit nature (Burns and Belton, 2013; Kirk et al., 2014) and form part of the confidential medical record (Privacy Commissioner, 2008). Therefore they require both protection and patient consent to be retained and used. The Copyright Council of New Zealand (2007) states that if employees take photographs in the course of their employment then the employer retains the copyright of that image unless agreed otherwise. This applied even if an agreement of such has not been stated in writing (Copyright Council of New

Zealand, 2007). To avoid disputes over image ownership and claims of misuse concerning photographs of patients or confidential patient information taken in the clinical setting, it is this author's final recommendation that written consent is always obtained for the intended purpose of the photographs and that ownership of photographic recordings is clearly stipulated in DHB policy documents.

5.9 Chapter summary and conclusion

It is evident here that the majority of health professionals are utilising mobile technology to assist with diagnosis and treatment in positive ways and if mobile photographic technology can be utilised whilst maintaining security effectively, patients will reap the benefits. Most health professionals are very aware of their responsibilities surrounding the maintenance of patient privacy but since the use of mobile phones for photography has only more recently started becoming a routine part of patient treatment, there is evidence here that not all health professionals understand the value of this visual information to patients and the responsibilities they have in making sure that these photographs are handled appropriately. Despite being the first study of it's kind in NZ, this was evidenced effectively in the course of this survey.

In conclusion, current policy on appropriate handling of these images across DHBs nationally needs to be reviewed and synchronised to match current use of mobile devices for photography in the clinical setting. As such, there needs to be:

- Clarification of image storage procedures
- A secure image sharing system on both a local and national scale
- Specific requirements for recording patient consent
- Updated best practice guidelines in conjunction with professional medical photography standards and codes of conduct.
- With more health professionals using their mobile phones to record patient images,

the role of the Medical Photographers within DHBs may need to be redefined/updated to assist with improving the regulation and management of photographic images taken within the healthcare setting.

A clear policy outlining appropriate use of mobile devices (both personal and hospital-owned) for photographing patients and confidential patient information would protect and benefit patients, health professionals and the integrity of the medical photography profession. Following this action, nursing, medical and allied health professionals all need to be made aware of the updated policy and hence their responsibilities so that they can participate in maintaining the safety and confidentiality of the patients that they care for in the current technological era.

References

Apple Inc. (2015). *iphone 6*. Retrieved from: http://www.apple.com/nz/iphone-6/specs/

Avast. (2014). *AVAST Demonstrates Risk of Selling Used Smartphones – Recovers 40,000 Personal Photos and Emails from Phones Bought Online.* Retrieved from: https://press.avast.com/en-us/avast-demonstrates-risk-of-selling-used-smartphones--recovers-40000-personal-photos-and-emails-from-phones-bought-online

Berle, I. (2008). Clinical photography and patient rights: the need for orthopraxy. *Journal of Medical Ethics, 34*(2), 89-92.

Bhangoo, P., Maconochie, I. K., Batrick, N., and Henry, E. (2005). Clinicians taking pictures -- a survey of current practice in emergency departments and proposed recommendations of best practice. *Emergency Medicine Journal, 22*(11), 761-765.

Boyce, N. (2012). The Lancet technology. *Lancet*, 379:209.

British Medical Journal. N.d. *Patient confidentiality*. Retrieved from: http://www.bmj.com/about-bmj/resources-authors/forms-policies-and-checklists/patient-confidentiality

Burns, K., and Belton, S. (2013). Clinicians and their cameras: policy, ethics and practice in an Australian tertiary hospital. *Australian Health Review, 37*(4), 437-441.

Copyright Council of New Zealand. (2007). *Information sheet: photographers.* Retrieved from: http://www.copyright.org.nz/viewInfosheet.php?sheet=340

Couper, M. P. (2000). Web surveys: A review of issues and approaches. *Public Opinion Quarterly, 64*, 464-494.

Couper, M. P., and Miller, P. V. (2008). Web survey methods. *Public Opinion Quarterly, 72*(5), 831-835.

Deloitte. (2015). *Technology, media and telecommunications predictions 2015.* Retrieved from: http://www2.deloitte.com/content/dam/Deloitte/global/Documents/Technology-Media-Telecommunications/gx-tmt-pred15-full-report.pdf

Denscombe, M. (2014). *The good research guide for small-scale social research projects*. 5th ed. Open Univerisity Press: Berkshire, England.

Devices 4 Limited. (2010). *A survey of mobile phone usage by health professionals in the UK*. Retrieved from: http://www.d4.org.uk/research/survey-mobile-phone-use-health-professionals-UK.pdf

Devon, K. M. (2013). A piece of my mind. Status update: whose photo is that? *Journal of the American Medical Association, 309*(18), 1901-1902.

Elton B. Stephens Company [EBSCO]. (2016). Nursing Resources, 2016. CINAHL Databases.
Retrieved from: https://www.ebscohost.com/nursing/products/cinahl-databases

EPG Health Media. (2012). *Focus Group Report: Healthcare Professional Use of Mobile Devices. A comparative study between Europe and US in 2010 and 2012*. Retrieved from: http://www.epghealthmedia.com/docs/reports/mobile-report-abstract.pdf

Hall, M. A., Dugan, E., Zheng, B., Mishra, A. K. (2001). Trust in physicians and medical institutions: what is it, can it be measured, and does it matter? *Milbank Q*, 79(4), 613–639.

Health and Disability Commissioner. (2009a). *Disclosure of confidential information obtained during doctor-patient consultation (01HDC04859)*. Retrieved from: http://www.hdc.org.nz/decisions--case-notes/case-notes/disclosure-of-confidential-information-obtained-during-doctor-patient-consultation-(01hdc04859)

Health and Disability Commissioner. (2009b). The HDC Code of Health and Disability Services Consumers' Rights Regulation 1996. Retrieved from: http://www.hdc.org.nz/the-act--code/the-code-of-rights/the-code-(summary)

Horizon Research. (2014). *Adult smartphone ownership will hit 79% within year.* Retrieved from: http://www.horizonpoll.co.nz/page/388/adult-smartphone-ownership-will-hit-79-within-

Institute of Medical Illustrators. (n.d.a). *Careers in Medical Illustration.* Retrieved from: http://www.imi.org.uk/document/careers-in-medical-illustration

Institute of Medical Illustrators. (n.d.b). *Home.* Retrieved from: http://www.imi.org.uk

Institute of Medical Illustrators. (2014a). *A Code of Professional Conduct for Professional members*. London: Institute of Medical Illustrators.

Institute of Medical Illustrators. (2014b). *Mobile phone photography guidelines.* London: Institute of Medical Illustrators.

Kirk, M., Hunter.-Smith, S.R., Smith, K., and Hunter-Smith, D.J. (2014). The role of smartphones in the recording and dissemination of medical images. *Journal of Mobile Technology in Medicine, 3*(2), 40-45.

Koehler, N., Vujovic, O., McMenamin, C. (2013). Healthcare professionals' use of mobile phones and the internet in clinical practice. *Journal of mobile technology in medicine.* 2(1), 3-13.

Kreuter, F., Presser, S., and Tourangeau, R. (2008). Social desirability bias in CATI, IVR and Web surveys. *Public Opinion Quarterly, 72*(5), 847-865.

Medical Council of New Zealand. (2014). *Code of ethics for the New Zealand medical profession.* Retrieved from: https://www.nzma.org.nz/__data/assets/pdf_file/0016/31435/NZMA-Code-of-Ethics-2014-A4.pdf

Mji, G., Schneider, M., Vergunst, R., and Swartz, L. (2014). On the ethics of being photographed in research in rural South Africa: views of people with disabilities. *Disability and Society, 29*(5), 714-723.

New South Wales Nurses Association. (2008). Nurse suspended for posting surgery photos on Facebook. (2008). *Lamp, 65*(9), 11-11.

Nursing Council of New Zealand. (2012). *Code of conduct for nurses.* Retrieved from: http://www.nursingcouncil.org.nz/Nurses/Code-of-Conduct

Oakley, A.M. (2015). Mobile teledermatology is here to stay. *British Journal of Dermatology,* 172, 844–860.

Ofcom. (2011). *International Communications Market Report.* Retrieved from: http://stakehold-ers.ofcom.org.uk/market-data-research/market-data/communications-market-reports/cmr11/international/

Privacy Commissioner. (2008). *Health information privacy code 1994.* Retrieved from: https://www.privacy.org.nz/assets/Files/Codes-of-Practice-materials/HIPC-1994-2008-revised-edition.pdf

Privacy commissioner. (2013). *Collection of information from subject: principle three.* Retrieved from: https://www.privacy.org.nz/the-privacy-act-and-codes/privacy-principles/collection-of-information-from-subject-principle-three/

Radio New Zealand. (2013, April 17). *DHB disciplines staff over privacy breach.* Retrieved from: http://www.radionz.co.nz/news/national/133017/dhb-disciplines-staff-over-privacy-breach

Research New Zealand. (2015). A Report on a Survey of New Zealanders' Use of Smartphones and other Mobile Communication Devices 2015. Retrieved from: http://www.researchnz.com/pdf/Special%20Reports/Research%20New%20Zealand%20Special%20Report%20-%20Use%20of%20Smartphones.pdf

Ridd, M., Shaw, A., Lewis, G., and Salisbury, C. (2003). The doctor-patient relationship: a synthesis of the qualitative literature on patients' perspectives. *British Journal of General Practice, 59, 268-275.*

Sax, L. J., Gilmartin, S. K., and Bryant, A. N. (2003). Assessing response rates and nonresponse bias in web and paper surveys. *Research in Higher Education, 44*(4), 409-432.

Scott, S. (2015, November 6). Sydney nurse who took explicit photo of patient under anaesthetic still practicing in NSW. *ABC News.* Retrieved from: http://www.abc.net.au/news/2015-11-06/sydney-nurse-takes-explicit-photo-of-patient/6916174

Taylor, K. (2013). Technology in general practice -- is it risky business? *Practice Nurse, 43*(5), 10-11.

Taylor, D.M., Foster, E., Dunkin, C.S.J., and Fitzgerald, A.M. (2007). A study of the personal use of digital photography within plastic surgery. *Journal of Plastic, Reconstructive and Aesthetic Surgery, 61*, 37-40.

Torrie, B., and King, C. (2013, July 3). Nosey clinicians await fate. *The Press.* Retrieved from: http://www.stuff.co.nz/national/health/8870226/Nosy-clinicians-await-fate

Tourangeau, R., Rips, L. J., and Rasinski, K. (2000). *The psychology of survey response.* Cambridge, England: Cambridge University Press.

The Economist. (2009). *Father of the cell phone.* Retrived from: http://www.economist.com/node/13725793?story_id=13725793,

United States National Library of Medicine. (2015). *Fact Sheet: Medline®.* Retrieved from: https://www.nlm.nih.gov/pubs/factsheets/medline.html

Van Dijck, J. (2008). Digital photography: communication, identity, memory. *Visual Communication, 7*(1), 57-76.

Wu, R., Morra, D., Quan, S., Lai,S., Zanjani, S., Abrams, H., and Rossos,P.G. (2010) The use of smartphones for clinical communication on internal medicine wards. *Journal of Hospital Medicine,* 5(9), 553-559.

Wu, R., Rossos, P.G., Quan, S., Reeves, S., Lo, V., Wong, B., Cheung, M., and Morra, D. (2011). An evaluation of the use of smartphonesto communicate between clinicians: A mixed-methods study. *Journal of Medical Internet Research,* 13 (3), e59.

Appendices

Appendix A: Local DHB policy (online screenshots)

9 Photography, Video, Audio and Related Recordings

Introduction

Recordings of patients or staff occur in three situations.

1. Clinical Recordings.
   As part of patient diagnosis and management.
   For education and/or research.

(**Note:** These do not include radiology and related procedures.)

2. Recordings by external agencies.
3. Private Recordings (made by patients or their relatives)

Principles

The two fundamental principles are:

1. Making a recording of any patient without informed consent is not permitted.

2. The requirements of the Privacy Act 1993 and the Health Information Privacy Code 1994 must be observed.

Any recordings must be made with consent, the major requirement being to protect the interests of the patient.

10 Clinical Casenote Recordings

For Diagnosis and Management

Where recordings are made as an integral and necessary part of patient treatment or management, written consent is required.

The recordings must be used purely for patient management and must be part of the patient's records or stored in a locked indexed filing system.

In no circumstances may these recordings be used for education or research purposes unless appropriate consent is given.

For Education and Research

Recordings made for purposes of clinical teaching or research require informed consent and compliance with storage requirements.

Consent

The prior written consent of the patient or patients who are to figure in the recording must be obtained.

Retrospective consent must be sought in cases where prior consent was impossible to obtain. If retrospective consent is denied, the recording must be destroyed.

In the case of any patient who is incapable of consenting personally, consent must be obtained from that patient's representative.

No patient who has declined consent may be included in a recording.

Where staff or relatives are to be included in the recordings their verbal consent must be obtained for recordings.

Medical Illustration

The Medical Illustrations Department should be contacted for the appropriate consent documentation.

Publication Consent

Where recordings are to be used for reproduction in a journal or textbook, inclusion in a display presentation or any other form of publication, or distributed or transmitted by electronic or digital media, consent using the appropriate consent form is required.

Consent to be "Informed" Consent

A consent is ineffective unless it is given following a disclosure of all the relevant information surrounding the recording, including:

- who is to make the recording
- why it is being made
- the audience for whom it is to be made

These matters must be specified in the written consent obtained.

The patient must not be subject to any pressure to give consent.

Ownership of Recordings

All recordings made in [redacted] DHB's institutions by health care staff must at all times be and remain the property of [redacted] DHB. Recordings should be identified by a [redacted] DHB label if feasible.

Storage

All recordings should be stored either in the clinical notes, or in locked indexed departmental storage areas suitable for the containment of clinical recordings.

Recordings may be transported outside the organisation only for a specific educational or research activity following which they must be returned to their usual storage place.

Recordings are to be identified by the patient's hospital number, rather than by use of the patient's name. There shall be no information on any recording which specifically identifies the patient.

Use of Recordings

No recordings may be used for any purpose other than the purpose or purposes specified in the consents obtained.

Who May Make Clinical Recordings?

In most situations clinical recordings will be made by the Company's medical illustration professionals. When registered health professional staff make clinical recordings because the medical illustration professional is not available, or there is urgency, the guidelines apply, including the obtaining of written informed consent.

11 Recording by External Agencies for Research Educational Purposes

Approval

Any person or organisation requires approval for filming or photography within [redacted] DHB premises.

Proposals for recordings must be submitted verbally or in writing to the General Manager or delegate and include:

- the proposal for the recording and the benefit it will generate
- the audience
- how long the recording will be in circulation
- statement that the proposed recording will fill a unique need and that there is no other suitable material available
- where appropriate the script is to be submitted for approval

Approval is given for the stated purpose only.

Consent

This must be obtained before any recording is made.

Consent forms are available from the Medical Illustrations Department.

Consent must be obtained from visitors and staff members to be filmed or photographed. They have the right to refuse.

12 Private Recordings

Introduction

Private recordings include any photographs, video and audio recordings made in any [redacted] DHB premises by patients or their families/whanau or support persons.

Patients, their families or support persons are entitled to make a recording except in the following circumstances:

- when making the recording might jeopardise patient safety
- when the staff involved in caring for the patient have not given consent to be recorded, and need to continue the caregiving

Patients, visitors and staff member's rights to privacy of identification are to be respected. The person wishing to make the recording must seek the verbal consent of all those likely to be included.

Specific unit policies may be developed (e.g. obstetrics).

Appendix B: The original survey by Kirk et al. (2014). (screenshot)

Participant Demographics:

1. Are you male or female?
2. What is your age range?
3. What is your current position within Peninsula Health?
4. In which department/unit are you currently working within Peninsula Health?

Mobile phone characteristics:

5. Do you own a mobile phone?
6. Does your mobile phone have a camera?
7. Is your mobile phone connected to the Internet?
8. Is your mobile phone password protected (PIN)?
9. Has Peninsula Health ever provided you with a camera in which to take medical images?

Medical smartphone photographic imaging:

10. Have you ever taken medical images in a clinical setting on a mobile device at Peninsula Health?
11. What consent did you gather from the patient?
12. Did you document that you took images in the patient medical record?
13. Do you delete medical images that have been TAKEN by you within Peninsula Health?
14. Of those images that have been TAKEN and kept by you, how are they stored?

Identifiable smartphone images:

15. Were these images identifiable? (i.e. including a name, hospital UR number, identifying features such as facial features or tattoos)
16. Have you ever shared IDENTIFIABLE images with another clinician?
17. What method did you use?
18. Did you record these transactions in the patient medical record?
19. How do you think these transactions affected the care of the patients involved?

Unidentifiable smartphone images:

20. Have you ever shared the NON-IDENTIFIABLE images with another clinician?
21. What method did you use?
22. Did you record these transactions in the patient medical record?
23. How do you think these transactions affected the care of the patients involved?

Smartphone images shared with you:

24. Has ANOTHER clinician from Peninsula Health ever shared medical images with you?
25. What method did they use?
26. Were you within the hospital campus or elsewhere at the time you received these images?
27. Was this transaction recorded in the medical record?
28. Do you delete medical images that have been shared with you from Peninsula Health staff?
29. Of those shared images that have been kept by you, how are they stored?
30. How do you think these transactions affected the care of the patients involved?
31. The reason I take medical images on my smartphone is; (Tick as many as applicable)
    a. For input from another clinician,
    b. For education/training,
    c. For presentation,
    d. Because it is interesting or unusual,
    e. To show someone outside the hospital,
    f. I do not take medical images on my smart phone,
    g. Comments.
32. Have you ever uploaded medical images to any web or social networking site? (e.g.: Twitter, Facebook, Flickr, Instagram, Google+)

Smartphone use and governance

33. Do you know if Peninsula Health has a policy regarding medical image photography?
34. Have you ever read a policy regarding the use of smartphones in healthcare?
35. Who do you believe owns any medical images taken within Peninsula Health?
36. Do you believe the use of clinical photographs and particularly smartphone images aids in the provision of patient care?

Appendix C: Approval from the Human Ethics Committee

UNIVERSITY OF CANTERBURY
Te Whare Wānanga o Waitaha
CHRISTCHURCH NEW ZEALAND

Ref: HEC 2015/81/LR

16 September 2015

Emily Keefe
School of Health Sciences
UNIVERSITY OF CANTERBURY

Dear Emily

Thank you for forwarding your low risk application to the Human Ethics Committee for the research proposal titled "What is the risk to safety and confidentiality in light of advancing mobile technology for patients undergoing hospital treatment in New Zealand?".

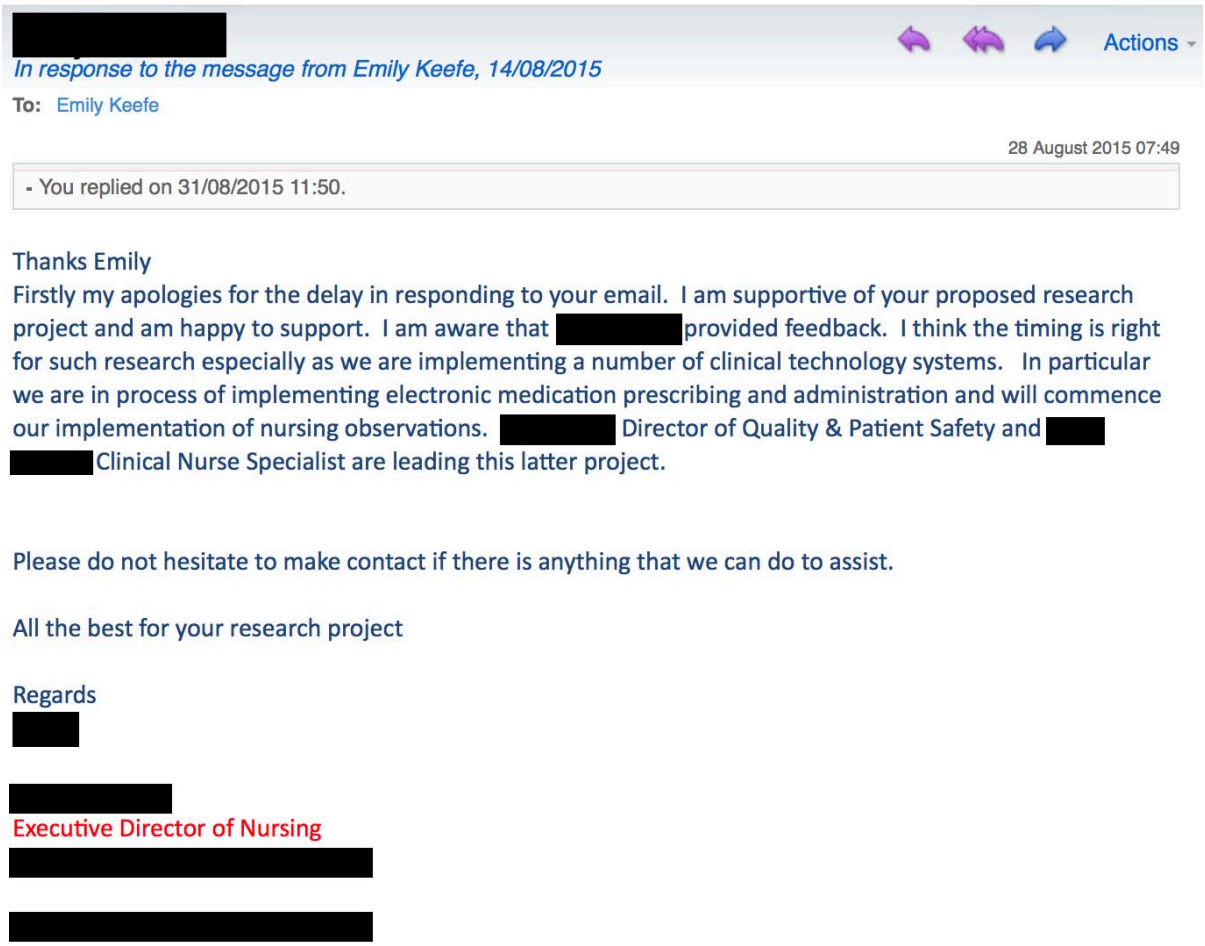
I am pleased to advise that the application has been reviewed and approved.

With best wishes for your project.

Yours sincerely

Lindsey MacDonald
Chair, Human Ethics Committee

Appendix D: Approval from the Executive Director of Nursing (screenshot)



[redacted]

Actions

In response to the message from Emily Keefe, 14/08/2015

To: Emily Keefe

28 August 2015 07:49

- You replied on 31/08/2015 11:50.

Thanks Emily
Firstly my apologies for the delay in responding to your email. I am supportive of your proposed research project and am happy to support. I am aware that [redacted] provided feedback. I think the timing is right for such research especially as we are implementing a number of clinical technology systems. In particular we are in process of implementing electronic medication prescribing and administration and will commence our implementation of nursing observations. [redacted] Director of Quality & Patient Safety and [redacted] Clinical Nurse Specialist are leading this latter project.

Please do not hesitate to make contact if there is anything that we can do to assist.

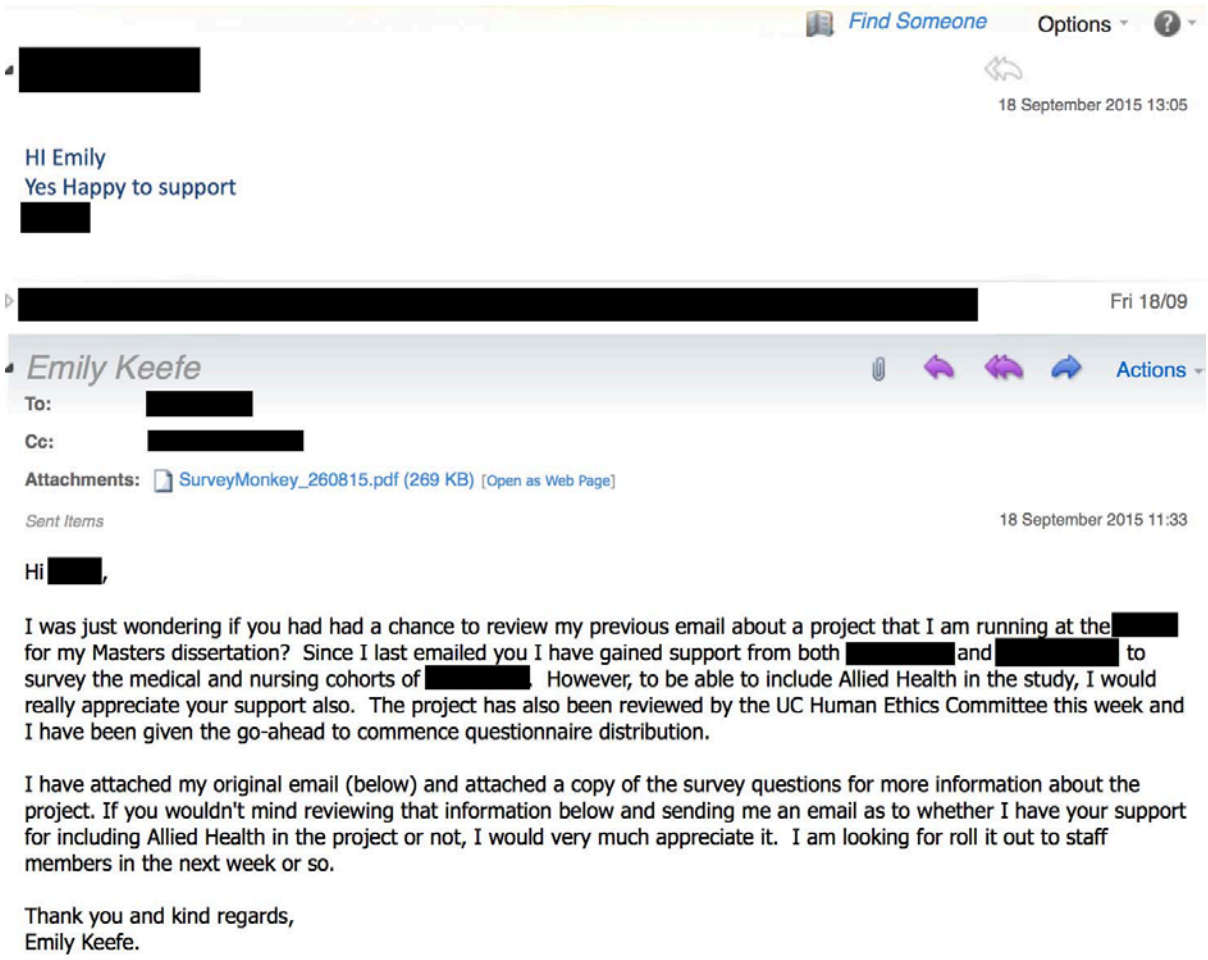
All the best for your research project

Regards
[redacted]

[redacted]
Executive Director of Nursing
[redacted]

[redacted]

Appendix E: Approval from the Executive Director of Allied Health (screenshot)



Find Someone Options

[redacted]

18 September 2015 13:05

HI Emily
Yes Happy to support
[redacted]

[redacted] Fri 18/09

Emily Keefe Actions

To: [redacted]

Cc: [redacted]

Attachments: SurveyMonkey_260815.pdf (269 KB) [Open as Web Page]

Sent Items 18 September 2015 11:33

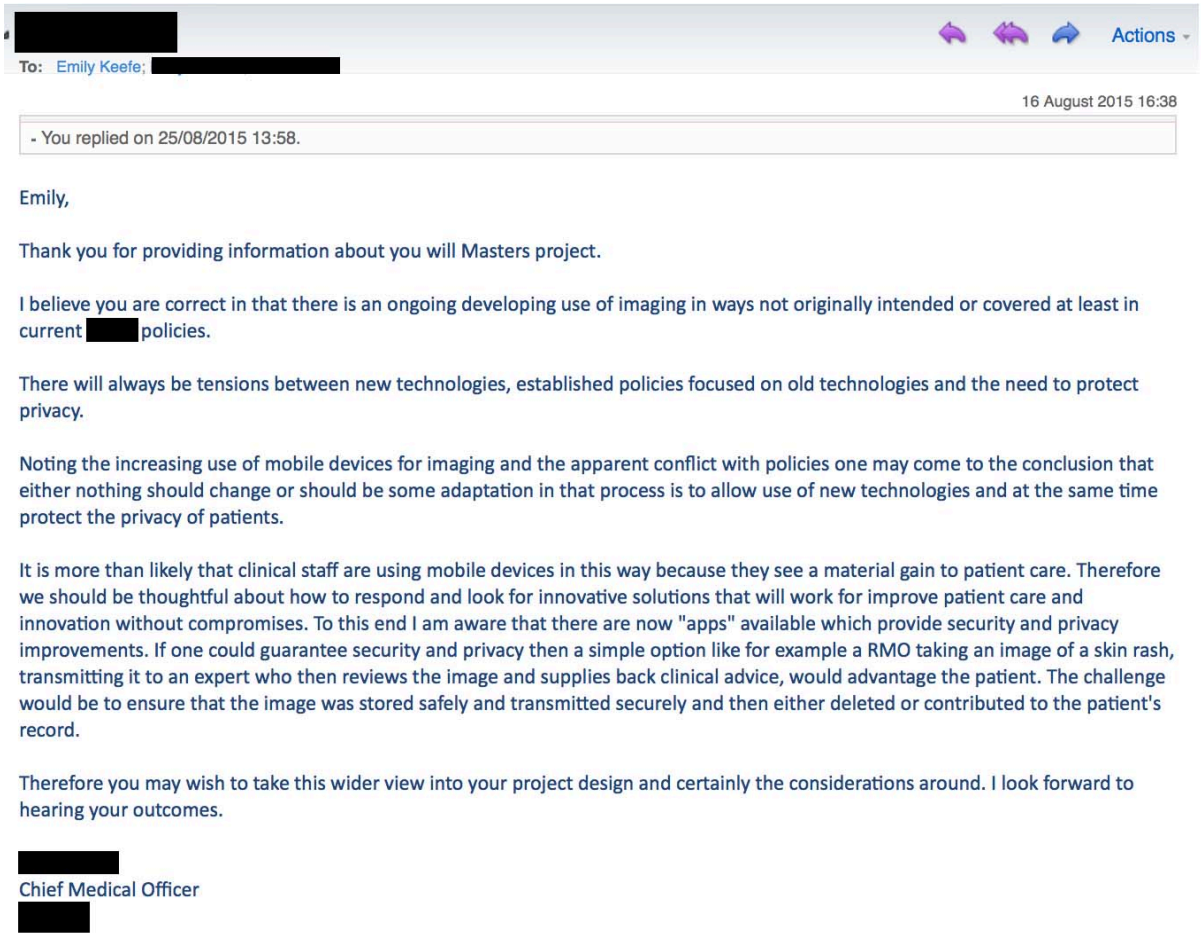
Hi [redacted],

I was just wondering if you had had a chance to review my previous email about a project that I am running at the [redacted] for my Masters dissertation? Since I last emailed you I have gained support from both [redacted] and [redacted] to survey the medical and nursing cohorts of [redacted]. However, to be able to include Allied Health in the study, I would really appreciate your support also. The project has also been reviewed by the UC Human Ethics Committee this week and I have been given the go-ahead to commence questionnaire distribution.

I have attached my original email (below) and attached a copy of the survey questions for more information about the project. If you wouldn't mind reviewing that information below and sending me an email as to whether I have your support for including Allied Health in the project or not, I would very much appreciate it. I am looking for roll it out to staff members in the next week or so.

Thank you and kind regards,
Emily Keefe.

Appendix F: Approval from the Chief Medical Officer (screenshot)



[redacted] Actions

To: Emily Keefe; [redacted]

16 August 2015 16:38

- You replied on 25/08/2015 13:58.

Emily,

Thank you for providing information about you will Masters project.

I believe you are correct in that there is an ongoing developing use of imaging in ways not originally intended or covered at least in current [redacted] policies.

There will always be tensions between new technologies, established policies focused on old technologies and the need to protect privacy.

Noting the increasing use of mobile devices for imaging and the apparent conflict with policies one may come to the conclusion that either nothing should change or should be some adaptation in that process is to allow use of new technologies and at the same time protect the privacy of patients.

It is more than likely that clinical staff are using mobile devices in this way because they see a material gain to patient care. Therefore we should be thoughtful about how to respond and look for innovative solutions that will work for improve patient care and innovation without compromises. To this end I am aware that there are now "apps" available which provide security and privacy improvements. If one could guarantee security and privacy then a simple option like for example a RMO taking an image of a skin rash, transmitting it to an expert who then reviews the image and supplies back clinical advice, would advantage the patient. The challenge would be to ensure that the image was stored safely and transmitted securely and then either deleted or contributed to the patient's record.

Therefore you may wish to take this wider view into your project design and certainly the considerations around. I look forward to hearing your outcomes.

[redacted]
Chief Medical Officer
[redacted]

Appendix G: Approval from the Research Office

[redacted]

24/09/2015

Dear [redacted]

Please find attached Locality Authorisation Form for CDHB Institutional sign-off.

Approval for this project has been provided by [redacted] (indicated by tabs).

Furthermore, Ethics approval has been provided by the University of Canterbury and [redacted] Maori consultation has been submitted. [redacted] is happy for the project to proceed although the project has yet to be heard.

Research Office No.	**15173**
Project Title / Protocol Number	**What is the risk of safety and confidentiality in light of advancing smartphone technology for patients undergoing hospital treatment in New Zealand**
Principal Investigator	**Emily Keefe (University of Canterbury Masters of Health Sciences Nursing Student)**

If you have any additional questions, please do not hesitate to contact me.

Kind regards,

[redacted]
Research Advisor for the [redacted]
Ph [redacted]

Research Office
P [redacted]

Appendix H: Approval from the Chair of the Maori Consultation Group

30th October 2015

Emily Keefe
Department of Health Sciences
University Of Canterbury

Re: What is the risk to safety and confidentiality in light of advancing smartphone technology for patients undergoing hospital treatment in New Zealand?

Tena koe Emily,

Ka nui te mihi tenei ki a koe me tou roopu o nga Kairapukorero ki te hapai o te kaupapa whakahirahira mou, moku mo tatou katoa. Ko Rapunga Korero te mea nui. No reira tena koe me te roopu o ka Kairangahau, tena koutou katoa.

Thank you for submitting your research for assessment by [redacted]. I note that your research is a quantitative survey of medical, nursing or allied health staff members currently employed by the [redacted]

As such it is always challenging to make comment in terms of achievement for improving Māori Health status.

However, we believe all health research conducted in New Zealand is of relevance to Māori and therefore impacts Māori wellbeing. Please refer to the following references in regard to improving Māori health status and referred to the HRC's Nga Pou Rangahau Hauora Kia Whakapiki Ake Te Hauora Māori 2004-2008 – The Health Research Strategy to Improve Māori Health and Well being 2004-2008.

The other reference that is available is Hauora Māori Standards of Health IV: A study of the years 2000-2005 by Bridget Robson and Ricci Harris, Māori Health Research Unit, Wellington School of Medicine. All provide Māori specific information on a range of health issues.

The recent publication Tatau Kahukura: Māori Health Chart Book 2010, Ministry of Health, 2010 (2nd edition), is an update relating to the socio economic determinants of health, health status and service utilisation of the Māori population. Further references are available from the HRC's Guidelines for Researchers on Health Research Involving Māori (page 22) www.hrc.govt.ac

It is a requirement of the ethics approval process that a final report be submitted when the research is complete. A copy of the report should be provided to me at that time. Te Komiti Whakarite would be willing to assist in the dissemination of your findings once your project has reached a successful conclusion to the appropriate Māori organisations, Māori health professionals and Māori researchers.

We do not intend to hinder the ethics approval process and therefore we do not require a response as the final decision is with the Ethics Committee.

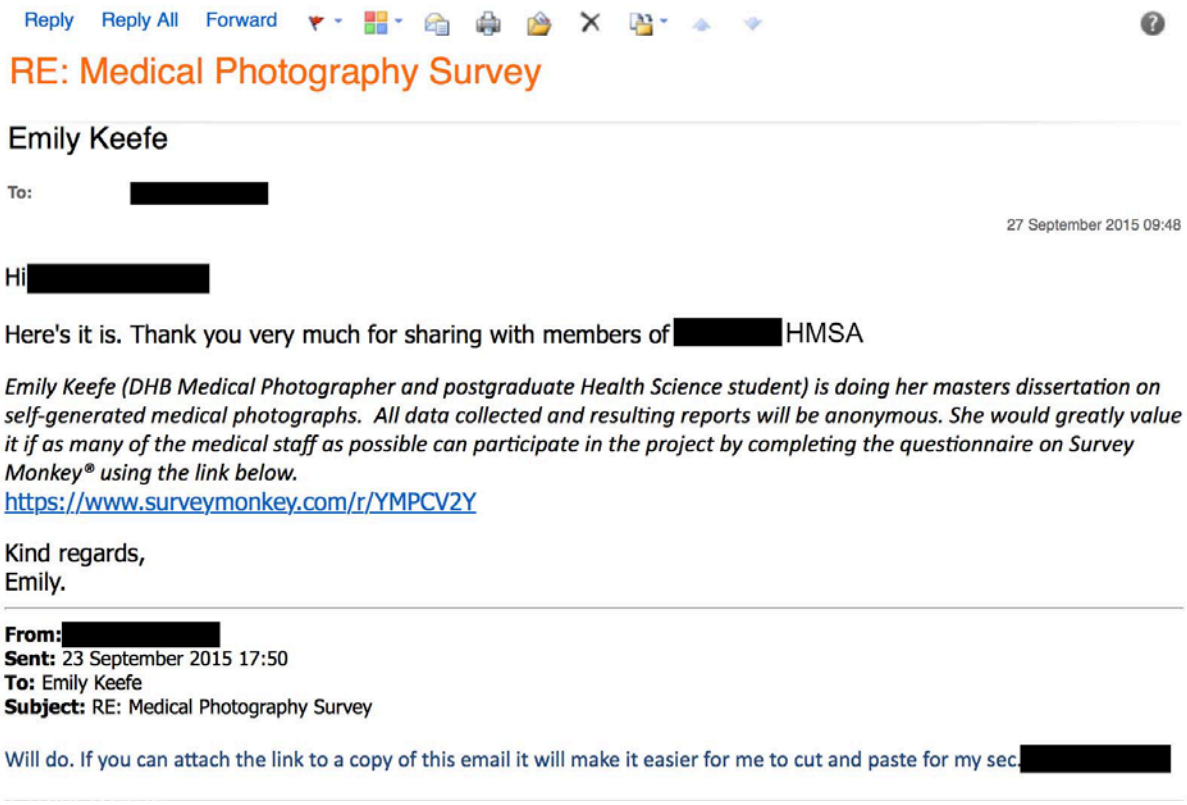
Heoi ano

[redacted]

[redacted] Chairperson [redacted]

Appendix I: Email to members of the local Hospital Medical Specialist Association

(screenshot)



Reply Reply All Forward

RE: Medical Photography Survey

Emily Keefe

To: [redacted]

27 September 2015 09:48

Hi[redacted]

Here's it is. Thank you very much for sharing with members of [redacted] HMSA

Emily Keefe (DHB Medical Photographer and postgraduate Health Science student) is doing her masters dissertation on self-generated medical photographs. All data collected and resulting reports will be anonymous. She would greatly value it if as many of the medical staff as possible can participate in the project by completing the questionnaire on Survey Monkey® using the link below.
https://www.surveymonkey.com/r/YMPCV2Y

Kind regards,
Emily.

From: [redacted]
Sent: 23 September 2015 17:50
To: Emily Keefe
Subject: RE: Medical Photography Survey

Will do. If you can attach the link to a copy of this email it will make it easier for me to cut and paste for my sec.[redacted]

Appendix J: The finalised questionnaire

UNIVERSITY OF CANTERBURY
Te Whare Wānanga o Waitaha
CHRISTCHURCH NEW ZEALAND

What is the risk to safety and confidentiality in light of advancing mobile technology for patients undergoing hospital treatment in New Zealand?

Information and Consent to Participate

You are invited to take part in this research because it has been noted that you are a medical, nursing or allied health staff member at your local District Health Board (DHB).

This project is being undertaken to explore the ownership and use of mobile phone technology amongst medical, nursing and allied health staff in the clinical setting of a DHB and aims to assess understanding and awareness of policy regarding photographic imaging.

Your participation in this research is anonymous and you are under no obligation to complete the survey as it is entirely voluntary. You have the right to withdraw at any stage during the survey without penalty and you may exit at any time by closing the browser window. By doing so your data will be deleted and untraceable. Please note that because the survey is anonymous, once you click SUBMIT at the end of the survey your completed questionnaire will not be retrievable.

Due to the anonymity of your responses, there will be no risk to you from this study. Neither the researcher nor the supervisor will have any knowledge or access to your personal identifying information and subsequently you will not be identifiable in any published reports. Data will be initially stored on the researchers password protected personal computer and backed up to a password protected hard drive until such time as the study period is complete (February 2016) when it will be removed and may be stored at the University of Canterbury indefinitely as part of national health data.

Completion of the survey will take approximately 5-10 minutes and you may or may not be required to answer all questions.

Cost of Participation: There will be no cost to you.

Ethical Approval: This research has been approved by the University of Canterbury Human Ethics Committee. Participants should address any complaints to The Chair, Human Ethics Committee, University of Canterbury, Private Bag 4800, Christchurch (human-ethics@canterbury.ac.nz).

Researcher: Emily Keefe, postgraduate student on the Master of Health Sciences/ Bachelor of Nursing joint programme. Contact: emily.keefe@yahoo.co.nz 021-1127-263

Supervisor: Dr Isabel Jamieson, Principal Academic Staff Member, Department of Nursing and Human Services, Christchurch Polytechnic Institute of Technology (CPIT), and Adjunct Senior

1

Fellow, University of Canterbury, College of Education, Health and Human Development, Health Sciences.
Contact: isabel.jamieson@cpit.ac.nz 027 388 5324

The researcher and the supervisor will be pleased to answer any questions you might have at any time prior to completing the survey.

If you agree to the conditions and are willing to participate in the study, please select YES in the options below and you may begin the questionnaire.

* I agree to take part in this study and have read and understood the participant information provided to me.

- ◯ Yes
- ◯ No

UNIVERSITY OF CANTERBURY
Te Whare Wānanga o Waitaha
CHRISTCHURCH NEW ZEALAND

What is the risk to safety and confidentiality in light of advancing mobile technology for patients undergoing hospital treatment in New Zealand?

Demographics

1. * What gender do you identify as?

- ◯ Male
- ◯ Female
- ◯ Other
- ◯ Prefer not to say

2 * What is your age range?

- ◯ < 25
- ◯ 25 - 34
- ◯ 35 - 44
- ◯ 45 - 54
- ◯ 55 - 64
- ◯ 65 and over

3 * What area are you employed in?

- ◯ Medical
- ◯ Nursing
- ◯ Allied Health
- ◯ Other


UC
UNIVERSITY OF CANTERBURY
Te Whare Wānanga o Waitaha
CHRISTCHURCH NEW ZEALAND
What is the risk to safety and confidentiality in light of advancing mobile technology for patients undergoing hospital treatment in New Zealand?
Medicine - Demographics
4* As a medical staff member, what area do you work in?


UC
UNIVERSITY OF CANTERBURY
Te Whare Wānanga o Waitaha
CHRISTCHURCH NEW ZEALAND
What is the risk to safety and confidentiality in light of advancing mobile technology for patients undergoing hospital treatment in New Zealand?
Nursing - Demographics
5* As a nursing staff member, what area do you practice in?


UC
UNIVERSITY OF CANTERBURY
Te Whare Wānanga o Waitaha
CHRISTCHURCH NEW ZEALAND
What is the risk to safety and confidentiality in light of advancing mobile technology for patients undergoing hospital treatment in New Zealand?
Allied Health - Demographics
6* As an allied health staff member, what area do you work in?


UC
UNIVERSITY OF CANTERBURY
Te Whare Wānanga o Waitaha
CHRISTCHURCH NEW ZEALAND
What is the risk to safety and confidentiality in light of advancing mobile technology for patients undergoing hospital treatment in New Zealand?
Mobile phone ownership
7* Do you own a mobile phone?
Yes
No

What is the risk to safety and confidentiality in light of advancing mobile technology for patients undergoing hospital treatment in New Zealand?

The characteristics of your mobile phone

8* Does your mobile phone have a camera function?

- ◯ Yes
- ◯ No

9* Is your mobile phone connected to the internet?

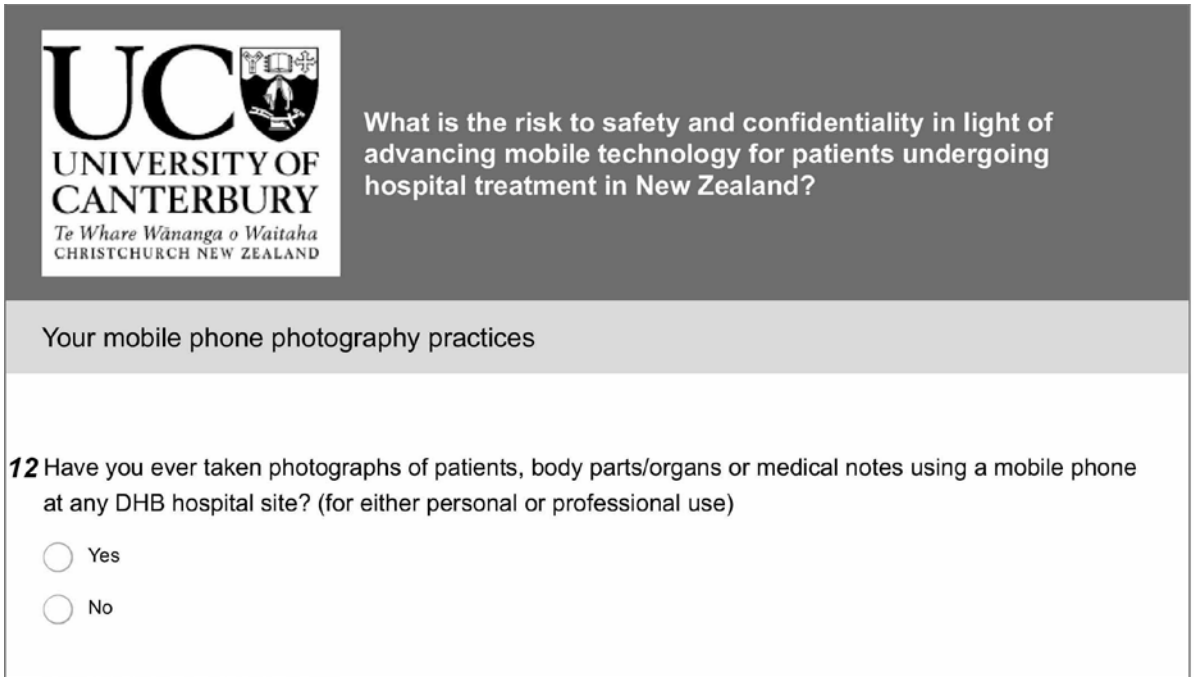
- ◯ Yes
- ◯ No

10 Is your mobile phone password / PIN protected?

- ◯ Yes
- ◯ No

11 Has your DHB ever provided you with a camera with which to take photographs?

- ◯ Yes and I use it for all images
- ◯ Yes and I use it sometimes
- ◯ Yes but I don't use it
- ◯ No


UC
UNIVERSITY OF CANTERBURY
Te Whare Wānanga o Waitaha
CHRISTCHURCH NEW ZEALAND
What is the risk to safety and confidentiality in light of advancing mobile technology for patients undergoing hospital treatment in New Zealand?
Your mobile phone photography practices
12 Have you ever taken photographs of patients, body parts/organs or medical notes using a mobile phone at any DHB hospital site? (for either personal or professional use)
Yes
No

UNIVERSITY OF CANTERBURY
Te Whare Wānanga o Waitaha
CHRISTCHURCH NEW ZEALAND

What is the risk to safety and confidentiality in light of advancing mobile technology for patients undergoing hospital treatment in New Zealand?

Your mobile phone photography practices

13 What consent do you gather from patients? (you may select more than one option)

- ☐ Verbal
- ☐ Written
- ☐ Third-party
- ☐ None

14 Do you record that you took images of patients, body parts/organs or medical notes in the patient record?

- ○ Always
- ○ Sometimes
- ○ Rarely
- ○ Never

15 Do you delete photographs of patients, body parts/organs or medical notes that have been taken by you?

- ○ Yes, I delete all images taken by me
- ○ No, I keep all images taken by me
- ○ No, I retain all images that I find interesting or unusual but delete all others

16 Of those photographs that have been TAKEN and kept by you, how are they stored?

- ○ Locally, on my mobile phone
- ○ Locally, on another storage device
- ○ Locally, on my mobile phone and on another storage device
- ○ Externally, saved to an internet 'Cloud' storage site, website or social networking site
- ○ Both locally and externally

10

17 Were these images identifiable? (i.e. including a name, NHI, identifying features such as facial features, tattoos, distinct skin markings)

- ◯ Yes
- ◯ No
- ◯ Some of them

What is the risk to safety and confidentiality in light of advancing mobile technology for patients undergoing hospital treatment in New Zealand?

Sharing identifiable images

18 Have you ever shared IDENTIFIABLE images with another health professional?
(i.e. images that include a patient's name, NHI or identifying features such as facial features, tattoos, or distinct skin markings)

- ◯ Yes
- ◯ No

UNIVERSITY OF CANTERBURY
Te Whare Wānanga o Waitaha
CHRISTCHURCH NEW ZEALAND

What is the risk to safety and confidentiality in light of advancing mobile technology for patients undergoing hospital treatment in New Zealand?

Sharing identifiable Images

19 What method did you use? (you may select more than one option)

- [ ] Physically showed them
- [ ] Multimedia Messaging (phone to phone)
- [ ] Email
- [ ] Via a social networking website
- [ ] Other (please specify)

20 Were these transactions recorded in the patient medical record?

- ○ Always
- ○ Sometimes
- ○ Rarely
- ○ Never

21 How do you think these transactions affected the care of the patients involved?

- ○ Positively
- ○ Negatively
- ○ Both
- ○ Neutral
- ○ Unsure

UNIVERSITY OF CANTERBURY
Te Whare Wānanga o Waitaha
CHRISTCHURCH NEW ZEALAND

What is the risk to safety and confidentiality in light of advancing mobile technology for patients undergoing hospital treatment in New Zealand?

Sharing non-identifable images

22 Have you ever shared NON-IDENTIFABLE images with another health professional?
(i.e. images that DO NOT include a patient's name, NHI or identifying features such as facial features, tattoos, or distinct skin markings)

- ◯ Yes
- ◯ No

UNIVERSITY OF CANTERBURY
Te Whare Wānanga o Waitaha
CHRISTCHURCH NEW ZEALAND

What is the risk to safety and confidentiality in light of advancing mobile technology for patients undergoing hospital treatment in New Zealand?

Non-Identifable Images

23 What method did you use? (you may select more than one option)

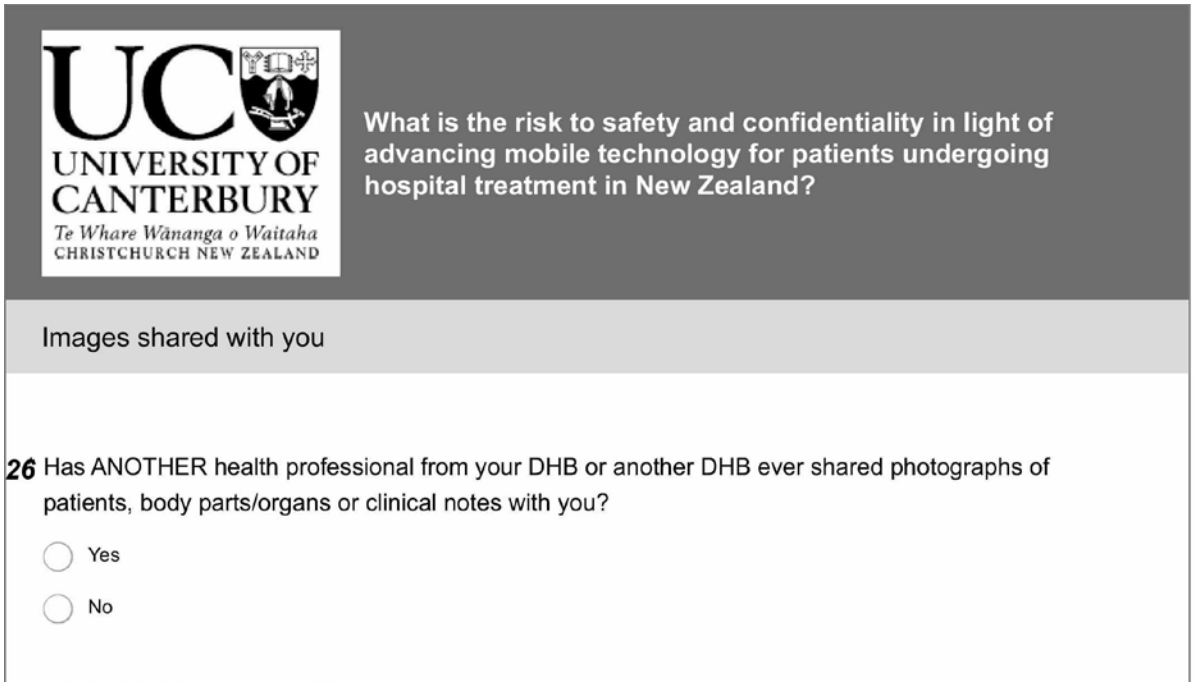
- [ ] Physically showed them
- [ ] Multimedia Messaging (phone to phone)
- [ ] Email
- [ ] Via a social networking website
- [ ] Other (please specify)

24 Were these transactions recorded in the patient medical record?

- ○ Always
- ○ Sometimes
- ○ Rarely
- ○ Never

25 How do you think these transactions affected the care of patients involved?

- ○ Positively
- ○ Negatively
- ○ Both
- ○ Neutral
- ○ Unsure



UNIVERSITY OF CANTERBURY
Te Whare Wānanga o Waitaha
CHRISTCHURCH NEW ZEALAND

What is the risk to safety and confidentiality in light of advancing mobile technology for patients undergoing hospital treatment in New Zealand?

Images shared with you

26 Has ANOTHER health professional from your DHB or another DHB ever shared photographs of patients, body parts/organs or clinical notes with you?

- ◯ Yes
- ◯ No

UNIVERSITY OF CANTERBURY
Te Whare Wānanga o Waitaha
CHRISTCHURCH NEW ZEALAND

What is the risk to safety and confidentiality in light of advancing mobile technology for patients undergoing hospital treatment in New Zealand?

Images shared with you

27 What method did they use? (You may select more than one option)

- [ ] Physically showed you
- [ ] Multimedia Messaging (phone to phone)
- [ ] Email
- [ ] Via a social networking website
- [ ] Other (please specify)

28 Were you located within one of your DHB's hospital sites or elsewhere at the times you received these images?

- ○ On-site
- ○ Off-site
- ○ Both

29 Were these transactions recorded in the patient's medical record?

- ○ Yes
- ○ No
- ○ Unsure

30 Do you delete images that others have shared with you?

- ○ Yes - I delete all images sent to me
- ○ No - I keep all images
- ○ No - I retain images that I find interesting or unusual but delete all others
- ○ I have never stored photographs of patients, body parts/organs or clinical notes

31 Of those shared images that have been kept by you, how are they stored?

- ◯ Locally - on my mobile phone
- ◯ Locally - on another storage device
- ◯ Locally - both on my mobile phone and another storage device
- ◯ Externally - saved to an internet 'Cloud' storage site, website or social networking site
- ◯ Both locally and externally
- ◯ I have never stored photographs of patients, body parts/organs or clinical notes

32 How do you think these transactions affected the care of the patients involved?

- ◯ Positively
- ◯ Negatively
- ◯ Both
- ◯ Neutral
- ◯ Unsure

UNIVERSITY OF CANTERBURY
Te Whare Wānanga o Waitaha
CHRISTCHURCH NEW ZEALAND

What is the risk to safety and confidentiality in light of advancing mobile technology for patients undergoing hospital treatment in New Zealand?

Mobile phone photography practices

33 "The reason I take photographs of patients, their body parts/organs or clinical notes on my mobile phone is..." (you may select more than one answer)

- [ ] For input from another health professional
- [ ] For education / training
- [ ] For presentation
- [ ] Because it is interesting or unusual
- [ ] To show someone outside the hospital
- [ ] I do not take photographs of patients, their body parts/organs or clinical notes on my mobile phone
- [ ] Other (please specify)

34 Have you ever uploaded a photograph of a patient, their body parts/organs or clinical notes to any website, social networking website or mobile app? (e.g. Twitter, Facebook, Flickr, Instagram, Figure 1)

- ◯ Yes
- ◯ No

What is the risk to safety and confidentiality in light of advancing mobile technology for patients undergoing hospital treatment in New Zealand?

Policies

35 Do you know if your DHB has a policy regarding photographic recording?

- ○ Yes - I have read one
- ○ Yes - But I have never read it
- ○ No - I am not aware of one

36 Who do you believe owns any photographs taken using a mobile phone whilst on your DHB site? (you may select more than one answer)

- ☐ The patient
- ☐ Those who take the photographs
- ☐ The DHB
- ☐ Those who receive the photographs
- ☐ Nobody owns them

What is the risk to safety and confidentiality in light of advancing mobile technology for patients undergoing hospital treatment in New Zealand?

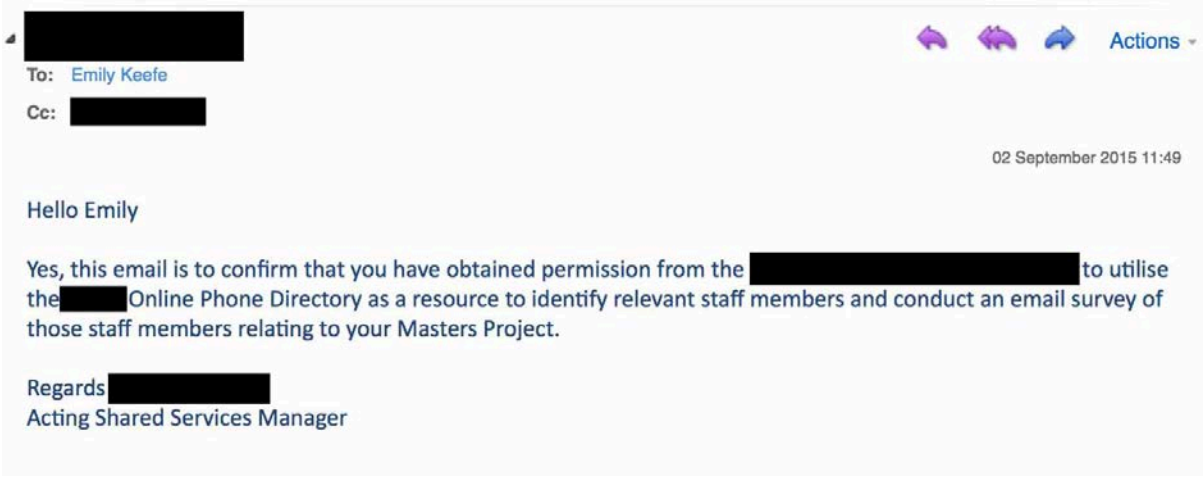
Thank you for completing the survey

By selecting SUBMIT at the bottom of this page, you answers will be saved and you will no longer be able to go back and make alterations or withdraw from the study.

Thank you for taking the time to participate.

Kind regards,
Emily Keefe.

Appendix K: Approval from the Human Resources department (online screenshot)



Appendix L: Email to potential participants (screenshot)

Dear [redacted] Staff Member,

You are invited to participate in a study exploring mobile phone ownership and use as a photographic tool in the hospital setting at your District Health Board.

The online questionnaire requires only 5-10 minutes of your time and all responses are completely anonymous. This research will form part of a Master's dissertation in Health Science at the University of Canterbury and has been approved by the [redacted] Research Office and the University of Canterbury Human Ethics Committee.

Nursing, medical and allied health staff across all departments and specialties are eligible to participate and a report of the results will enable the researcher to assess the risk to patient safety and confidentiality in light of advancing mobile phone technology. Your contribution could be influential in shaping the best practice of mobile phone technology in healthcare for both today's and tomorrow's health professionals.

The link below will take you straight to the online survey where further information can be found for potential participants.

https://www.surveymonkey.com/r/YMPCV2Y

Any questions or concerns should be directed to Emily Keefe at ejk49@uclive.ac.nz

Thank you for taking the time to participate in this research. Your contribution is greatly appreciated.

Kind regards,
Emily Keefe.

Appendix M: Advert released in the local DHB newsletter and daily internal communication email (screenshot)